MITSUBISHI ELECTRIC

<ORIGINAL>

CE

# Air Conditioning Control System
# **Centralized Controller**
# **AE-200A/AE-50A/EW-50A**
# **AE-200E/AE-50E/EW-50E**

## Instruction Book
## –BACnet® function–

Before using the controller, please read this Instruction Book carefully to ensure proper operation.
Retain this manual for future reference.
BACnet® is a registered trademark of ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers, INC.).

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# Safety precautions

- ► **Observe these precautions carefully to ensure safety.**
- ► **After reading this manual, pass the manual on to the end user to retain for future reference.**
- ► **The user should keep this manual for future reference and refer to it as necessary. This manual should be made available to those who repair or relocate the units. Make sure that the manual is passed on to any future air conditioning system user.**

| | |
|---|---|
| ⚠ WARNING | : indicates a hazardous situation which, if not avoided, could result in death or serious injury. |
| ⚠ CAUTION | : indicates a hazardous situation which, if not avoided, could result in minor or moderate injury. |
| CAUTION | : addresses practices not related to personal injury, such as product and/or property damage. |

## General precautions

### ⚠ WARNING

**Do not install the controller in areas where large amounts of oil, steam, organic solvents, or corrosive gases (such as ammonia, sulfuric compounds, or acids), or areas where acidic/alkaline solutions or special chemical sprays are used frequently. These substances may significantly reduce the performance and corrode the internal parts, resulting in electric shock, malfunction, smoke, or fire.**

**To reduce the risk of short circuits, current leakage, electric shock, malfunction, smoke, or fire, do not wash the controller with water or any other liquid.**

**To reduce the risk of electric shock, malfunction, smoke, or fire, do not touch the electrical parts, USB memory, or touch panel with wet fingers.**

**To reduce the risk of injury or electric shock, before spraying a chemical around the controller, stop the operation and cover the controller.**

**To reduce the risk of injury, keep children away while installing, inspecting, or repairing the controller.**

**If you notice any abnormality (e.g., burning smell), stop the operation, turn off the controller, and consult your dealer. Continuing the operation may result in electric shock, malfunction, or fire.**

**Properly install all required covers to keep moisture and dust out of the controller. Dust accumulation and the presence of water may result in electric shock, smoke, or fire.**

### ⚠ CAUTION

**To reduce the risk of fire or explosion, do not place flammable materials or use flammable sprays around the controller.**

**To reduce the risk of electric shock or malfunction, do not touch the touch panel, switches, or buttons with a sharp object.**

**To avoid injury from broken glass, do not apply excessive force to the glass parts.**

**To reduce the risk of injury, electric shock, or malfunction, avoid contact with the sharp edges of certain parts.**

**Consult your dealer for the proper disposal of the controller. Improper disposal will pose a risk of environmental pollution.**

## Precautions for relocating or repairing the unit

**⚠ WARNING**

**The controller must be repaired or moved only by qualified personnel. Do not disassemble or modify the controller. Improper installation or repair may result in injury, electric shock, or fire.**

## Additional precautions

**CAUTION**

**To avoid discoloration, do not use benzene, thinner, or chemical rag to clean the controller. When the controller is heavily soiled, wipe the controller with a well-wrung cloth that has been soaked in water with mild detergent, and then wipe off with a dry cloth.**

**This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.**

## Terms used in this manual

- “Centralized Controller AE-200A/AE-200E” is referred to as “AE-200”.
- “Centralized Controller AE-50A/AE-50E” is referred to as “AE-50”.
- “Centralized Controller EW-50A/EW-50E” is referred to as “EW-50”.
- “PI controller (PAC-YG60MCA)” is referred to as “PI controller”.
- “AI controller (PAC-YG63MCA)” is referred to as “AI controller”.
- “OA Processing Unit (LOSSNAY with heater and humidifier)” is referred to as “OA Processing Unit”.
- “e-Series chiller unit (EAHV, EACV)” is referred to as “Chiller unit”.
- “Chiller unit of MEHITS” is referred to as “MEHT-CH&HP unit”.

# 1. Parts to be used

## 1-1. Required parts

Obtain the items listed below from your dealer before using this function.

| No. | Item | Remarks |
|---|---|---|
| 1 | AE-200/AE-50/EW-50 Instruction Book (BACnet® function) | This manual |
| 2 | “BACnet connection” license for AE-200/AE-50/EW-50 | Required for each AE-200/AE-50/EW-50 that connects to BACnet®. |
| 3 | BACnet® Setting Tool | Used for configuring BACnet® function for AE-200/AE-50/EW-50. |
| 4 | Software update file | Used for updating the AE-200/AE-50/EW-50 to the latest version. The versions of all AE-200/AE-50/EW-50 that connect to BACnet® must be the same. |

The items listed above are essential to use the BACnet® function. For equipment that are required for initial settings and trial runs of the BACnet® function, refer to section 7-2 “Preparatory items for initial settings”.
When using the apportioned electricity billing function with the BACnet® function, the parts that are used for the apportioned electricity billing function are also required. For details, refer to the AE-200/AE-50/EW-50 Instruction Book (Apportioned Electricity Billing Function).

## 1-2. Separately sold parts

None.
When using the apportioned electricity billing function with the BACnet® function, the parts that are used for the apportioned electricity billing function are also required. For details, refer to the AE-200/AE-50/EW-50 Instruction Book (Apportioned Electricity Billing Function).

## 1-3. Commercially available parts

Where necessary, prepare the commercially available parts listed below.

| | Item | Qty | Remarks |
|---|---|---|---|
| Communication item | LAN cable | As appropriate | Category 5 or above straight cable (Max. 100 m (328 ft)) *1 |
| | Switching HUB | Required number | 100 BASE-TX-compatible |

*1 If the LAN cable is to be longer than 100 m, pass this through a switching HUB.

When using the apportioned electricity billing function with the BACnet® function, the parts that are used for the apportioned electricity billing function are also required. For details, refer to the AE-200/AE-50/EW-50 Instruction Book (Apportioned Electricity Billing Function).

# 2. Before use

This manual explains how to use the AE-200/AE-50/EW-50 BACnet® function.
For how to install AE-200/AE-50/EW-50 or how to use the functions other than the BACnet® function, refer to the AE-200/AE-50/EW-50 Installation Manual and Instruction Book.
For how to use the BACnet® Setting Tool, refer to the AE-200/AE-50/EW-50 Instruction Book (BACnet® Setting Tool).
When using the apportioned electricity billing function with the BACnet® function, refer to the AE-200/AE-50/EW-50 Instruction Book (Apportioned Electricity Billing Function) and the AE-200/AE-50/EW-50 Instruction Book (BACnet® Apportioned Electricity Billing Function Trial Run).

## 2-1. Introduction

The AE-200/AE-50/EW-50 BACnet® function can be used when connecting AE-200/AE-50/EW-50 to the open network BACnet® that is used for the building management system.
The air conditioning units connected to AE-200/AE-50/EW-50 can be monitored and operated not only from the existing web browser or the AE-200/AE-50's LCD, but also from the building management system using the BACnet® communication protocol.

Note

The explanation of the BACnet® function in this manual is based on the specification of AE-200/AE-50/EW-50 software version 7.97.
Chiller unit does not support the apportioned electricity billing function.

## 2-2. License

The licenses related to the AE-200/AE-50/EW-50 BACnet® function are as follows.

| License name | Requirement condition | Required number and remarks |
|---|---|---|
| "BACnet connection" | Required when using the BACnet® function | One license is required for each AE-200/AE-50/EW-50 that connects to BACnet®. |
| "Charge" | Required when using the apportioned electricity billing function | One license is required for the AE-200 that is used for electricity apportioning and each AE-50/EW-50 that connects to the AE-200. |

## 2-3. Models of units that can be controlled with BACnet®

The table below shows models that can connect to AE-200/AE-50/EW-50, and models that can be controlled with the BACnet® function.

V: Connectable/Controllable
—: Not connectable/Not controllable

| Model | | Connectable/Not connectable to AE-200/AE-50/EW-50 | Controllable/Not controllable with BACnet® |
|---|---|---|---|
| CITY MULTI | S series | V | V |
| | Y series | V | V |
| | HP series | V | V |
| | R2 series | V | V |
| | WY series | V | V |
| | WR2 series | V | V |
| | HVRF series | V | V |
| Air conditioning unit with outlet air temperature control | | V | V |
| LOSSNAY | | V | V (Only when groups are configured.) |
| OA Processing Unit | | V | V (Only when groups are configured.) |
| Air To Water Booster unit/Air To Water (PWFY) | | V | V |
| A-control unit (Mr. Slim) | | An adapter is required. | V |
| K-control unit | | — | — |
| Room air conditioner (RAC) | | An interface is required. | V |
| Hot Water Heat Pump unit (CAHV, CRHV, QAHV) | | V | — |
| Chiller unit | | V | V |
| MEHT-CH&HP unit | | V *1 | — |
| DIDO controller (PAC-YG66DCA) | | V | — |
| PI controller (PAC-YG60MCA) | | V | V |
| AI controller (PAC-YG63MCA) | | V | — |

*1 Only AE-200E/AE-50E/EW-50E.

## 2-4. Restrictions and cautions

Restrictions and cautions for AE-200/AE-50/EW-50 BACnet® functions are as follows.

### (1) Action to take when an error occurs

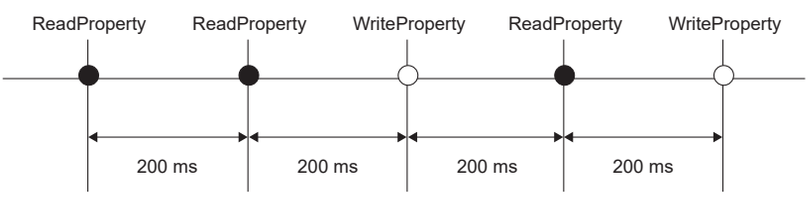
Immediately carry out repairs to the problem area when an error related to air conditioning units is detected on the building management system.

### (2) Functions

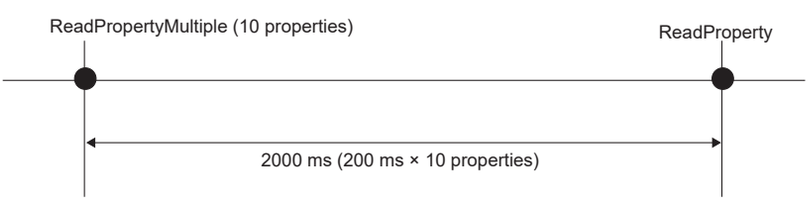
Due to continuing improvement, specifications are subject to change without notice.

### (3) Request interval

When sending “ReadProperty” or “WriteProperty” from the building management system to the AE-200/AE-50/EW-50, set the interval to 200 (ms/property) or above.



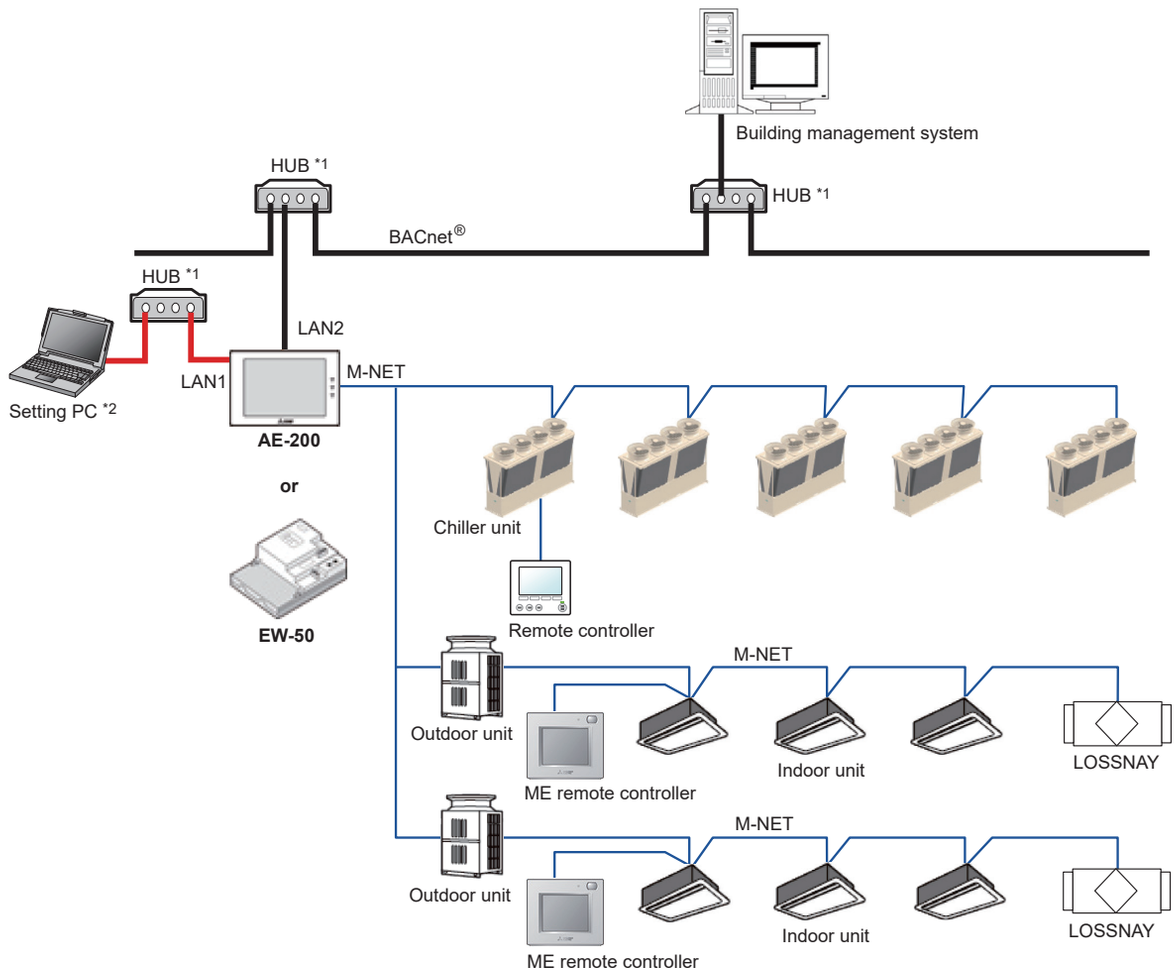

When sending 10 properties using “ReadPropertyMultiple”, wait for at least 2000 ms (= 200 ms × 10 properties) before sending another request to the AE-200/AE-50/EW-50.



# 3. Usage (System configurations)

## 3-1. Sample system configurations

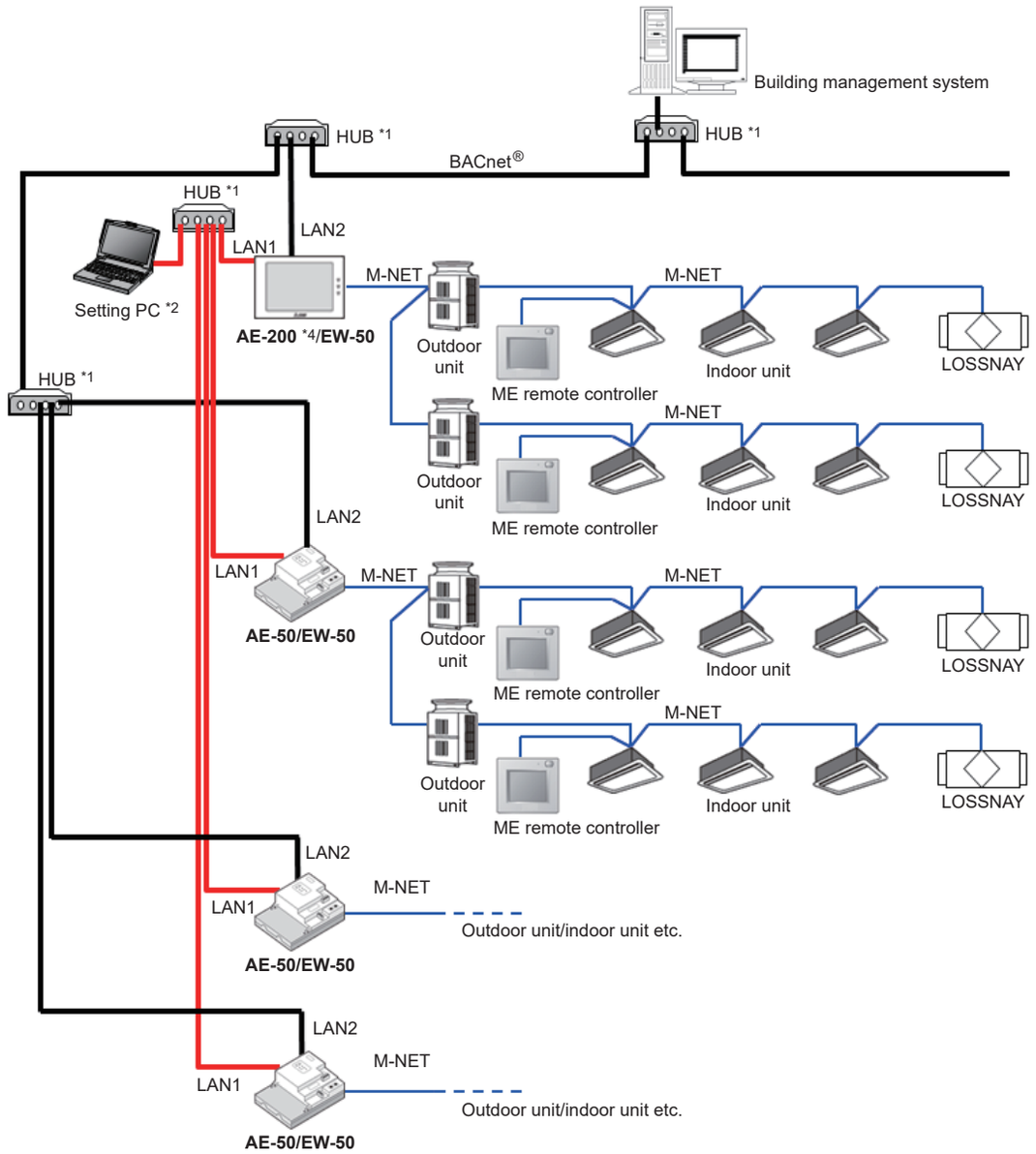
### (1) When controlling 50 or fewer units of equipment and not using an apportioned electricity billing function




*1 Use a switching HUB to connect to LAN1 and LAN2 (BACnet®). Do not connect LAN1 and LAN2 (BACnet®) to the same HUB.

*2 A PC (hereafter referred to as Setting PC) is required to make settings for the AE-200/EW-50 BACnet® functions. After making settings, disconnect the Setting PC as well as LAN cables and HUBs used to connect to the Setting PC from the AE-200/EW-50. Refer to section 7 “Checking installation operations and performing trial run” for details.

## (2) When controlling more than 50 units of equipment *3 and not using an apportioned electricity billing function



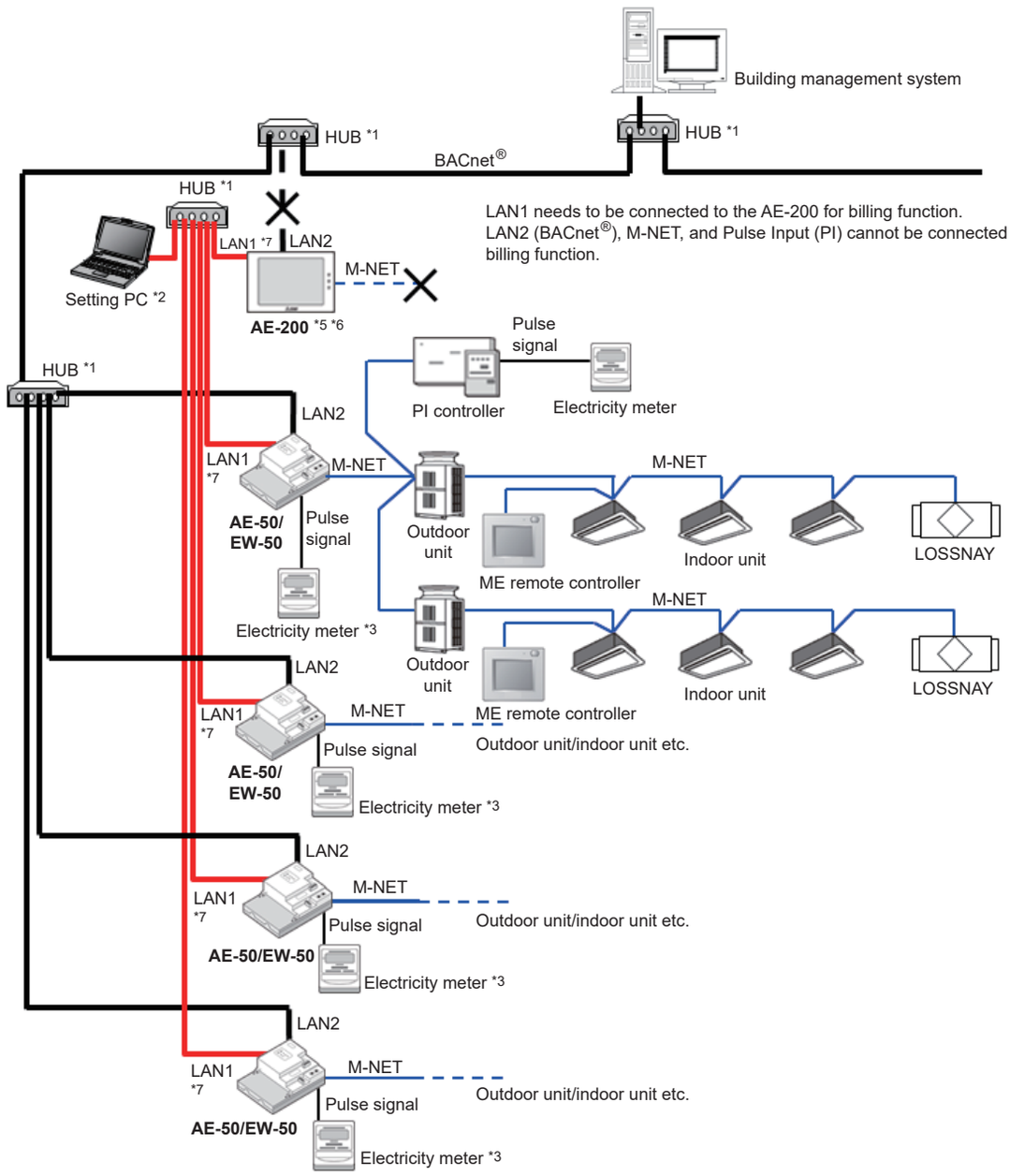

*1 Use a switching HUB to connect to LAN1 and LAN2 (BACnet®). Do not connect LAN1 and LAN2 (BACnet®) to the same HUB.

*2 A PC (hereafter referred to as Setting PC) is required to make settings for the AE-200/AE-50/EW-50 BACnet® functions. After making settings, disconnect the Setting PC from the AE-200/AE-50/EW-50. Refer to section 7 “Checking installation operations and performing trial run” for details.

*3 Up to 50 units of equipment can be connected to and controlled by each AE-200/AE-50/EW-50. If performing centralized control with an AE-200, up to 3 AE-50/EW-50 can be connected to a single AE-200 (if not using AE-200 M-NET, up to 4 can be connected).

*4 If performing centralized control with an AE-200, because time synchronization from the building management system comes through the AE-200, then for systems including those that do not have BACnet® control functions, configure so that AE-200 is connected to the BACnet®, by connecting devices to control with BACnet® to the AE-200.

## (3) When using an apportioned electricity billing function *4




*1 Use a switching HUB to connect to LAN1 and LAN2 (BACnet®). Do not connect LAN1 and LAN2 (BACnet®) to the same HUB.

*2 A PC (hereafter referred to as Setting PC) is required to make settings for the AE-50/EW-50 BACnet® functions. After making settings, disconnect the Setting PC from the AE-50/EW-50. Refer to section 7 “Checking installation operations and performing trial run” for details.

*3 If using the apportioned electricity billing function, we recommend that instead of using the AE-50/EW-50 built-in Pulse Input (PI), the PI controller be used for measurement of electric energy.
(If AE-50/EW-50 built-in Pulse Input (PI) is used, pulse input will not be possible when the AE-50/EW-50 is stopped, during power outages or during software updates. This could result in discrepancies between the measurements and the actual electric energy consumed.)
When using the AE-50/EW-50 built-in Pulse Input (PI), approve the above-mentioned restrictions for the customer and then use.

*4 Up to 50 units of equipment can be connected to and controlled by each AE-50/EW-50. Up to 4 AE-50/EW-50 controllers can be connected to each AE-200 for billing function.

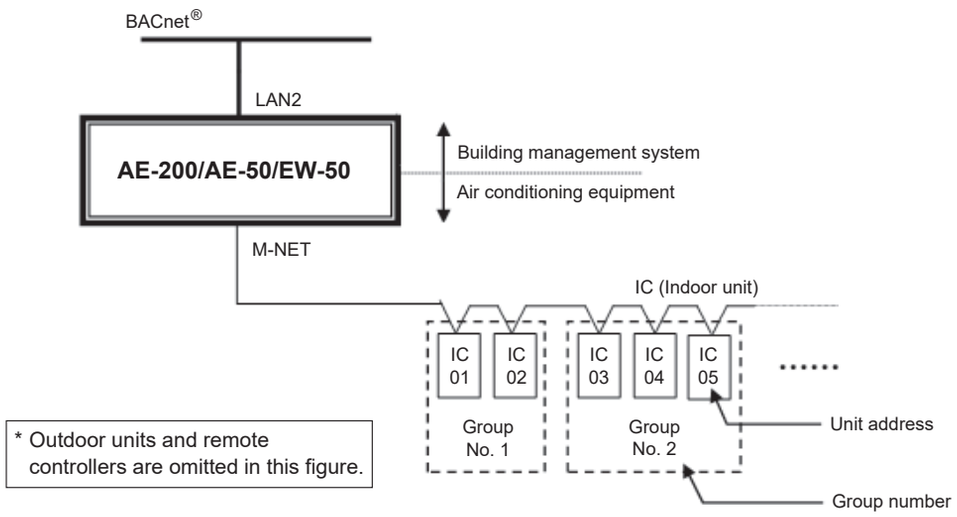
*5 To use an apportioned electricity billing function and perform date and time synchronization from the building management system, set the “Time Master/Sub” setting to “Sub” on the AE-200 for billing function and synchronize the time from AE-50/EW-50 connected to BACnet®. The “Time Master/Sub” setting can be made on the Initial Setting Tool or AE-200/AE-50’s LCD. (Refer to the AE-200/AE-50/EW-50 Instruction Book (Initial Settings) for settings methods.)

*6 If using the apportioned electricity billing function, connection of M-NET and Pulse Input (PI) to the AE-200 for billing function is prohibited. Accordingly, the AE-200 for billing functions does not have any BACnet® control devices, and BACnet® connection is not necessary. As a result, BACnet® settings and "BACnet connection" license are not required for the AE-200 for billing function.

*7 If using the apportioned electricity billing function, connection of LAN1 for transfer of power apportioning information is required.

## 3-2. Group configurations

The basic functions of the BACnet® function can be performed for each unit group.
Multiple indoor units (ICs) in a group can collectively be controlled.
The group number is a range of 1 to 50.




## 3-3. Chiller unit systems and group configuration

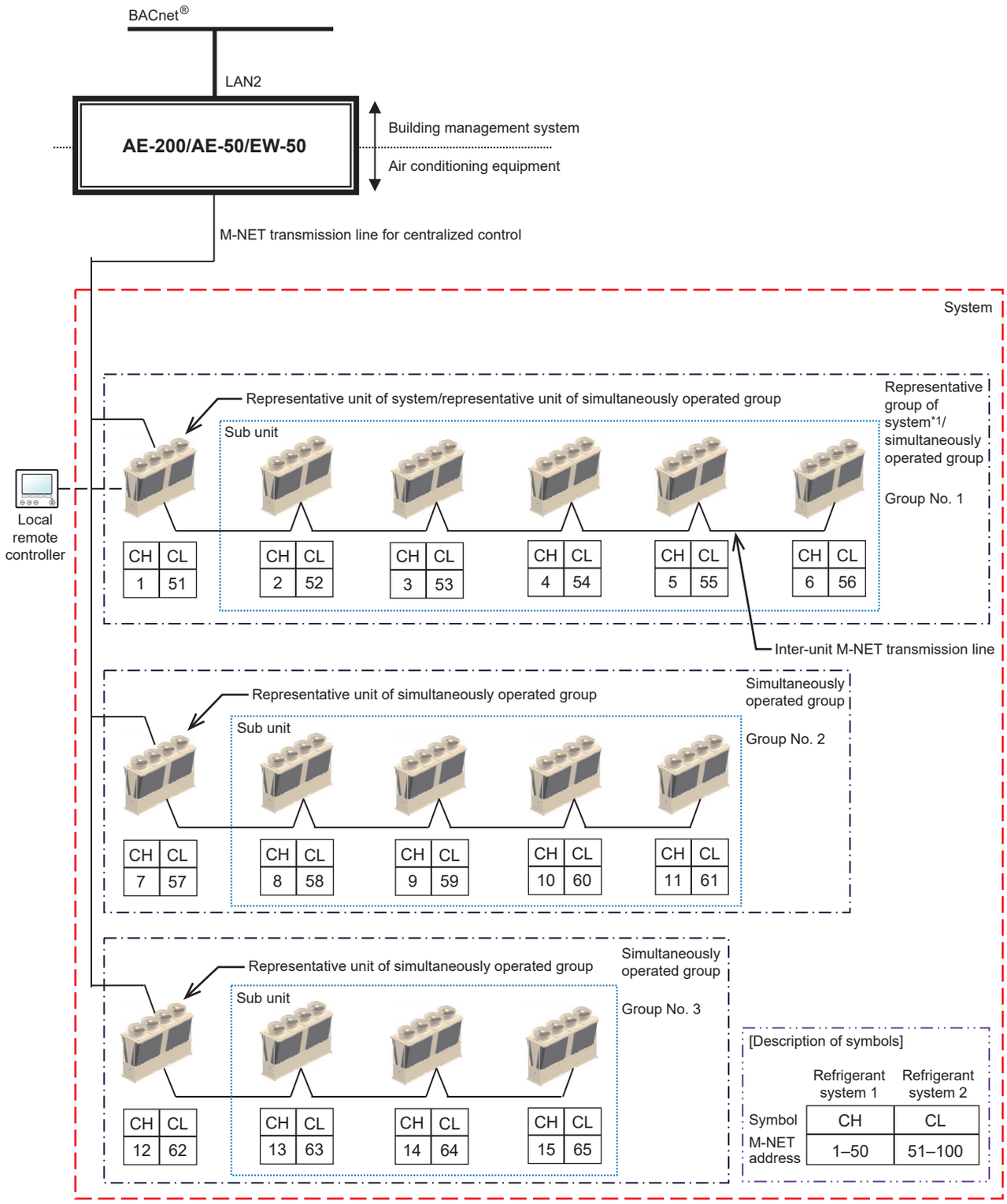
The AE-200/AE-50/EW-50 controls chiller systems or individual chiller units using the basic functions of BACnet®. When talking about chiller units, a set of water pipes is referred to as a “system,” and the units operated simultaneously are referred to as a “simultaneously operated group.”
One unit consists of two control boards (unit system 1 “CH” and unit system 2 “CL”) that require M-NET address setting. Each simultaneously operated group consists of a maximum of six units.
A maximum of 24 chiller units can be connected to each AE-200, AE-50, or EW-50.
However, when connecting both chiller units and air conditioning units to a single AE-200/AE-50/EW-50, the total number of chiller units (18 units or fewer) times three and the number of air conditioning units combined must be 50 or fewer.

Chiller-unit-related terms are explained and system configuration examples are shown below.

| Name | Description |
|---|---|
| System | System refers to a set of water pipes. Units are operated in the unit of systems. (Remote controllers are separately connected to each system.) |
| System representative group | A group of simultaneously operated units including a system representative unit |
| Simultaneously operated group | A group of units that are operated simultaneously |
| System representative unit | This unit receives operation commands and performs control of the units in the system. This unit transmits operation commands to the representative unit in the group of simultaneously operated units in the system. |
| Representative unit in the simultaneously operated group | This unit receives operation commands from the system representative unit in the group of simultaneously operated units. This unit sends the operation commands to the sub unit in the group of simultaneously operated units based on the operation command information from the system representative unit. |
| Sub unit | This unit operates according to the operation command information from the representative unit in the group of simultaneously operated units. |
| Unit system 1 and 2 | One unit consists of unit system 1 "CH" and unit system 2 "CL." |

The group number will be set to a range between 1 and 50. Group numbers of the chiller units and those of other types of units must not overlap.
See “5-2. Basic functions” for the details of basic functions.

System configuration of the chiller unit (example)




*1 When the object for monitoring/operating the chiller unit system is executed, the representative group of the system will be monitored/operated.

# 4. Usage (Communication specifications)

## 4-1. BACnet® specifications

BACnet® communication specifications are based on ANSI/ASHRAE Standard 135-2010.

## 4-2. Communication protocol specifications

### (1) Overview of protocol

- Use BACnet®/IP based on ANSI/ASHRAE Standard 135-2010 on UDP/IP of Ethernet®*.
- LAN2 is used to connect BACnet®.

| Ether header | IP header | UDP header | BVLL header | NPCI header | APDU |
|---|---|---|---|---|---|

* Ethernet® is a registered trademark of Xerox Corporation in the United States.

### (2) Ether header

The physical layer is Ethernet® and the specifications are 100BASE-TX.

### (3) IP header

A Class C private address is recommended *1. The sub-net mask is 255. 255. 255. 0.

*1 Recommended values (range): [192.168.2.1] to [192.168.254.254]
[192.168.0.0] and [192.168.255.255] should not be used for a LAN2 IP address.
An IP address set using LAN1 should not be used as a LAN2 IP address.
LAN1 and LAN2 network addresses must not be the same.

### (4) UDP header

47808 (0xBAC0) is recommended for the default UDP port for unicast and broadcast.

### (5) BVLL header

BVLC type (1 octet): 0x81 fixed (BVLL for BACnet®/IP)
BVLC function (1 octet): 0x0A for unicast
0x0B for broadcast
BVLC length (2 octets): Variable (BVLL header (4) + APDU data length)
(The above is a typical example. For details, refer to ANSI/ASHRAE Standard 135-2010.)

### (6) BACnet® NETWORK NPCI header

Version (1 octet): 0x01 fixed
Control (1 octet): 0x04 with response message
0x00 without response message
(The above is a typical example. For details, refer to ANSI/ASHRAE Standard 135-2010.)

### (7) APDU for BACnet®

Data of 1,024 octets and under.
(Refer to ANSI/ASHRAE Standard 135-2010 for details.)

## 4-3. Objects

Support status for objects and for BACnet® functions are listed below.

V: Supported
—: Not supported

| Object type *1 | | Abbreviation | Supported/ Not supported | Object |
|---|---|---|---|---|
| Access Credential | (32) | — | — | |
| Access Door | (30) | — | — | |
| Access Point | (33) | — | — | |
| Access Rights | (34) | — | — | |
| Access User | (35) | — | — | |
| Access Zone | (36) | — | — | |
| Accumulator | (23) | AC | V | Group Apportioned Electric Energy<br>Interlocked Units Apportioned Electric Energy<br>PIcontroller Electric Energy 1–4<br>Pulse Input Electric Energy 1–4<br>Group Apportionment Parameter<br>Interlocked Units Apportionment Parameter |
| Analog Input | (0) | AI | V | Room Temp [Water Temp]<br>Chiller Representative Inlet Water Temp<br>Chiller Representative Outlet Water Temp<br>Error Code Detail |
| Analog Output | (1) | — | — | |
| Analog Value | (2) | AV | V | Set Temp [Set Water Temp]<br>Set Temp Cool<br>Set Temp Heat<br>Set Temp Auto<br>Set High Limit Setback Temp<br>Set Low Limit Setback Temp<br>Chiller Set Temp Cool<br>Chiller Set Temp Heat |
| Averaging | (18) | — | — | |
| Binary Input | (3) | BI | V | On Off State<br>Alarm Signal *2<br>Filter Sign [Circulating Water Exchange Sign]<br>M-NET Communication State<br>Night Purge State<br>Thermo On Off State<br>System Alarm Signal *2<br>External Heat Source State<br>PIcontroller Alarm Signal *2<br>Chiller On Off State<br>Chiller Representative Alarm Signal<br>Chiller Communication State<br>Chiller Unit Alarm Signal |
| Binary Output | (4) | BO | V | On Off Setup *3<br>Chiller On Off Setup |
| Binary Value | (5) | BV | V | Filter Sign Reset [Circulating Water Exchange Sign Reset]<br>Prohibition On Off *3<br>Prohibition Mode<br>Prohibition Filter Sign Reset [Prohibition Circulating Water Exchange Sign Reset]<br>Prohibition Set Temperature<br>Prohibition Fan Speed<br>System Forced Off (individual)/(collective) *4<br>Chiller Prohibition On Off<br>Chiller Prohibition Mode<br>Chiller Prohibition Set Temperature |
| BitString Value | (39) | — | — | |
| Calendar | (6) | — | — | |
| CharacterString Value | (40) | — | — | |
| Command | (7) | — | — | |
| Credential Data Input | (37) | — | — | |

| Object type *1 | | Abbreviation | Supported/ Not supported | Object |
|---|---|---|---|---|
| Date Pattern Value | (41) | — | — | |
| Date Value | (42) | — | — | |
| DateTime Pattern Value | (43) | — | — | |
| DateTime Value | (44) | — | — | |
| Device | (8) | DEV | V | Device object of AE-200/AE-50/EW-50 |
| Event Enrollment | (9) | — | — | |
| Event Log | (25) | — | — | |
| File | (10) | — | — | |
| Global Group | (26) | — | — | |
| Group | (11) | — | — | |
| Integer Value | (45) | — | — | |
| Large Analog Value | (46) | — | — | |
| Life Safety Point | (21) | — | — | |
| Life Safety Zone | (22) | — | — | |
| Load Control | (28) | — | — | |
| Loop | (12) | — | — | |
| Multi-state Input | (13) | MI | V | Error Code<br>Operational Mode State<br>Fan Speed State<br>Air Direction State<br>Ventilation Mode State<br>Air To Water Mode State<br>Chiller Operational Mode State<br>Chiller Fan Mode State |
| Multi-state Output | (14) | MO | V | Operational Mode Setup<br>Fan Speed Setup<br>Air Direction Setup<br>Ventilation Mode Setup<br>Air To Water Mode Setup<br>Chiller Operational Mode Setup<br>Chiller Fan Mode Setup |
| Multi-state Value | (19) | — | — | |
| Network Security | (38) | — | — | |
| Notification Class | (15) | CLS | V | Notification Class |
| OctetString Value | (47) | — | — | |
| Positive Integer Value | (48) | — | — | |
| Program | (16) | — | — | |
| Pulse Converter | (24) | — | — | |
| Schedule | (17) | — | — | |
| Structured View | (29) | — | — | |
| Time Pattern Value | (49) | — | — | |
| Time Value | (50) | — | — | |
| Trend Log | (20) | LOG | V | Trend Log Room Temp<br>Trend Log Group Apportioned Electric Energy<br>Trend Log Interlocked Units Apportioned Electric Energy<br>Trend Log PIcontroller Electric Energy 1–4<br>Trend Log Pulse Input Electric Energy 1–4<br>Trend Log Group Apportionment parameter<br>Trend Log Interlocked Units Apportionment parameter |
| Trend Log Multiple | (27) | — | — | |

*1 Values within parentheses are “Object_Type” property values.

*2 Outputs an error code (4-digit) in Description and Message Text of event notification.

*3 Do not use this when “External Input Setting” for AE-200/AE-50/EW-50 is set to “ON/OFF (Level signal)”. “External Input Setting” can be configured on the Initial Setting Tool or AE-200/AE-50’s LCD. (Refer to the AE-200/AE-50/EW-50 Instruction Book (Initial Settings) for settings methods.)

*4 Executes the stop command and remote controller operation prohibition (run/stop) command for air conditioning units.

## 4-4. Services

The BACnet® service support status is shown below.

V: Supported
—: Not supported
Initiate request: Provides services
Execute request: Receives and uses services

| Service | | Initiate request | Execute request |
|---|---|---|---|
| 1. Alarm and Event Services | (1) Acknowledge Alarm Service | — | — |
| | (2) ConfirmedCOVNotification Service | V | — |
| | (3) ConfirmedEventNotification Service | V | — |
| | (4) GetAlarmSummary Service | — | — |
| | (5) GetEnrollmentSummary service | — | — |
| | (6) GetEventInformation Service | — | V |
| | (7) LifeSafetyOperation Service | — | — |
| | (8) SubscribeCOV Service *1 | — | V |
| | (9) SubscribeCOVProperty Service | — | — |
| 2. File Access Services | (1) AtomicReadFile Service | — | — |
| | (2) AtomicWriteFile Service | — | — |
| 3. Object Access Services | (1) AddListElement Service | — | V |
| | (2) RemoveListElement Service | — | V |
| | (3) CreateObject Service | — | — |
| | (4) DeleteObject Service | — | — |
| | (5) ReadProperty Service | — | V |
| | (6) ReadPropertyConditional Service | — | — |
| | (7) ReadPropertyMultiple Service | — | V |
| | (8) ReadRange Service | — | V |
| | (9) WriteProperty Service | — | V |
| | (10) WritePropertyMultiple Service | — | V |
| 4. Remote Device Management Services | (1) DeviceCommunicationControl Service | — | — |
| | (2) ConfirmedPrivateTransfer Service | — | — |
| | (3) ConfirmedTextMessage Service | — | — |
| | (4) ReinitializeDevice Service | — | — |
| 5. Virtual Terminal Services | (1) VT-Open Service | — | — |
| | (2) VT-Close Service | — | — |
| | (3) VT-Data Service | — | — |
| 6. Security Services | (1) Authenticate Service | — | — |
| | (2) Request Key Service | — | — |
| 7. Unconfirmed Services | (1) I-Am | V | V |
| | (2) I-Have | V | — |
| | (3) UnconfirmedCOVNotification Service | V | — |
| | (4) UnconfirmedEventNotification Service | V | — |
| | (5) UnconfirmedPrivateTransfer Service | — | — |
| | (6) UnconfirmedTextMessage Service | — | — |
| | (7) TimeSynchronization Service | — | V |
| | (8) UTCTimeSynchronization Service | — | — |
| | (9) Who-Has | — | V |
| | (10) Who-Is | V | V |

*1 The maximum number of COV notifications which can be registered is 3,150. However, 5 is the maximum number of COV notifications which can be registered in which Lifetime is not = 0.

## 4-5. Services for each object

The table below lists the supported services for each object.

○ : Supported
△ : Settings can be changed on the BACnet® Setting Tool.
INIT: Provides services (Initiate)
EXEC: Receives and executes services (Execute)

| Service \ Object | | Device | Analog Input | Analog Value | Binary Input | Binary Output | Binary Value | Multi-State Input | Multi-State Output | Notification Class | Accumulator | Trend Log |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ConfirmedCOVNotification | INIT | | △ | △ | △ | △ | △ | △ | △ | | | |
| | EXEC | | | | | | | | | | | |
| ConfirmedEventNotification | INIT | | △ | | △ | △ | | | | | △ | |
| | EXEC | | | | | | | | | | | |
| GetEventInformation | INIT | | | | | | | | | | | |
| | EXEC | ○ | | | | | | | | | | |
| SubscribeCOV | INIT | | | | | | | | | | | |
| | EXEC | ○ | | | | | | | | | | |
| AddListElement | INIT | | | | | | | | | | | |
| | EXEC | | | | | | | | | ○ | | |
| RemoveListElement | INIT | | | | | | | | | | | |
| | EXEC | | | | | | | | | ○ | | |
| ReadProperty | INIT | | | | | | | | | | | |
| | EXEC | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| ReadPropertyMultiple | INIT | | | | | | | | | | | |
| | EXEC | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| ReadRange | INIT | | | | | | | | | | | |
| | EXEC | ○ | | | | | | | | ○ | | ○ |
| WriteProperty | INIT | | | | | | | | | | | |
| | EXEC | | ○ | ○ | ○ | ○ | ○ | | ○ | ○ | ○ | ○ |
| WritePropertyMultiple | INIT | | | | | | | | | | | |
| | EXEC | | ○ | ○ | ○ | ○ | ○ | | ○ | ○ | ○ | ○ |
| I-Am | INIT | ○ | | | | | | | | | | |
| | EXEC | ○ | | | | | | | | | | |
| I-Have | INIT | ○ | | | | | | | | | | |
| | EXEC | | | | | | | | | | | |
| UnconfirmedCOVNotification | INIT | | △ | △ | △ | △ | △ | △ | △ | | | |
| | EXEC | | | | | | | | | | | |
| UnconfirmedEventNotification | INIT | | △ | | △ | △ | | | | | △ | |
| | EXEC | | | | | | | | | | | |
| TimeSynchronization | INIT | | | | | | | | | | | |
| | EXEC | △ | | | | | | | | | | |
| Who-Has | INIT | | | | | | | | | | | |
| | EXEC | ○ | | | | | | | | | | |
| Who-Is | INIT | ○ | | | | | | | | | | |
| | EXEC | ○ | | | | | | | | | | |

# 5. Usage (Function specifications)

The AE-200/AE-50/EW-50 BACnet® function mutually converts communications for air conditioning equipment connected to the AE-200/AE-50/EW-50 and for BACnet® communications.

## 5-1. Controller functions and BACnet® functions

The table below lists the supported controller functions which can monitor/operate from the web browser or the AE-200/AE-50's LCD and the BACnet® functions.

V: Supported
—: Not supported

| Classification | Item | Controller function | BACnet® function | Remarks |
|---|---|---|---|---|
| Monitor/ Operation | On Off Setup | V | V | |
| | On Off State | V | V | |
| | Operational Mode Setup | V | V | |
| | Operational Mode State | V | V | |
| | Fan Speed Setup | V | V | |
| | Fan Speed State | V | V | |
| | Air Direction Setup | V | V | BACnet® does not support "Downblow 20%" and "Auto" settings. |
| | Air Direction State | V | V | BACnet® does not support "Downblow 20%" and "Auto" settings. |
| | Room Temp [Water Temp] | V | V | |
| | Set Temp [Set Water Temp] | V | V | |
| | Set Temp Cool | V | V | |
| | Set Temp Heat | V | V | |
| | Set Temp Auto | V | V | |
| | Set High Limit Setback Temp | V | V | Only AE-200A/AE-50A/EW-50A |
| | Set Low Limit Setback Temp | V | V | Only AE-200A/AE-50A/EW-50A |
| | Ventilation Mode Setup | V | V | |
| | Ventilation Mode State | V | V | |
| | Air To Water Mode Setup | V | V | |
| | Air To Water Mode State | V | V | |
| | Night Purge Setup | V | — | |
| | Night Purge State | V | V | |
| | Prohibition On Off | V | V | |
| | Prohibition Mode | V | V | |
| | Prohibition Filter Sign Reset [Prohibition Circulating Water Exchange Sign Reset] | V | V | |
| | Prohibition Set Temperature | V | V | |
| | Prohibition Timer | V | — | |
| | Prohibition Air Direction | V | — | |
| | Prohibition Fan Speed | V | V | |
| | System Forced Off (individual) | V | V | |
| | System Forced Off (collective) | V | V | |
| | Thermo On Off State | V *1 | V *2 | |
| | External Heat Source State | — | V | Output status of indoor unit CN24 |

| Classification | Item | Controller function | BACnet® function | Remarks |
|---|---|---|---|---|
| Alarm monitor | Alarm Signal (Air conditioning unit/PI controller) | V | V | |
| | Error Code | V | V | Controllers support 4-digit error codes, and BACnet® supports 1- and 4-digit error codes. |
| | System Alarm Signal | V | V | |
| | M-NET Communication State | V | V | |
| | Filter Sign [Circulating Water Exchange Sign] | V | V | |
| | Filter Sign Reset [Circulating Water Exchange Sign Reset] | V | V | |
| Control functions | Command Failure | — | V | |
| | High Limit/Low Limit Alarm | V *3 | V | |
| | Night Setback control | V | — | |
| | Schedule control | V | — | |
| | Interlock control | V | — | |
| Data management functions | Energy management data/ Trend log | V | V | These are collected individually in the body/BACnet®, so sometimes the values of these do not coincide. |
| | Group Apportioned Electric Energy | V | V | |
| | Interlocked Units Apportioned Electric Energy | V | V | |
| | Group Apportionment Parameter | V | V | BACnet® function has only parameters for outdoor units. |
| | Interlocked Units Apportionment Parameter | V | V | BACnet® function has only parameters for outdoor units. |
| | PIcontroller Electric Energy (Ch 1–4) | V | V | |
| | Pulse Input Electric Energy (Metering device 1–4) | V | V | |
| Other functions | Unit of temperature setting | V | V | This setting on the AE-200/AE-50/EW-50 and the one on the BACnet® are different. On the BACnet®, only the unit of temperature that is used for BACnet® communication can be set. |
| | Cumulative operation time/ FAN operation time | V | — | |
| | Time management | V | V | |
| | BACnet® router | — | V | |
| | LCD lock | V | — | |

| Classification | Item | Controller function | BACnet® function | Remarks |
|---|---|---|---|---|
| Chiller monitor/ operation | Chiller On Off Setup | V | V | |
| | Chiller On Off State | V | V | |
| | Chiller Operational Mode Setup | V | V | |
| | Chiller Operational Mode State | V | V | |
| | Chiller Fan Mode Setup | V | V | |
| | Chiller Fan Mode State | V | V | |
| | Chiller Outdoor Temp | V | — | |
| | Chiller Inlet Water Temp | V | — | |
| | Chiller Outlet Water Temp | V | — | |
| | Chiller Representative Inlet Water Temp | V | V | |
| | Chiller Representative Outlet Water Temp | V | V | |
| | Chiller Set Temp Cool | V | V | |
| | Chiller Set Temp Heat | V | V | |
| | Chiller Drive Ratio (By Unit) | — *4 | — | |
| | Chiller Prohibition On Off | V | V | |
| | Chiller Prohibition Mode | V | V | |
| | Chiller Prohibition Set Temperature | V | V | |
| Chiller alarm monitor | Chiller Representative Alarm Signal | — *4 | V | |
| | Chiller Communication State | — | V | |
| | Chiller Unit Alarm Signal | V | V | |

*1 Supports only Thermo-ON time, Thermo-ON/OFF count.
Thermo-ON/OFF count cannot be monitored from the AE-200/AE-50's LCD or web browser, but can be checked with the CSV output function.

*2 Supports only Thermo-ON/OFF state.

*3 Alarms can occur when the upper and lower limit values are exceeded due to the AI controller (option).

*4 This item cannot be monitored or operated from the AE-200/AE-50's LCD or the Integrated Centralized Control Web, but can be checked with the CSV output function.

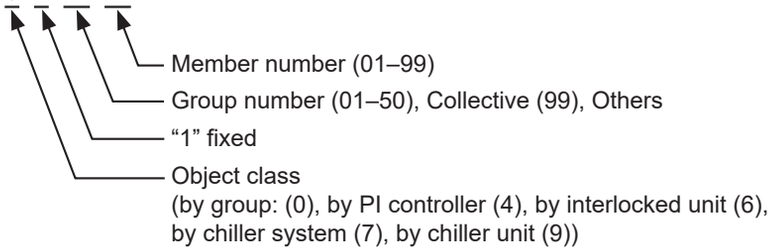
## 5-2. Basic functions

Sends commands from the building management system to air conditioning equipment. Additionally, sends the air conditioning equipment status to the building management system.

### 5-2-1. Instance number for basic functions

The instance number is configured of the object type + fixed value “1” + group number + member number.

Instance number (6 digits in decimal notation): 0 1 xx xx


Member number (01–99)
Group number (01–50), Collective (99), Others
“1” fixed
Object class
(by group: (0), by PI controller (4), by interlocked unit (6), by chiller system (7), by chiller unit (9))

Objects that can be used with the AE-200/AE-50/EW-50 are shown in the table below.

| Object | Object type | Instance number | Units | | | | | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | Inactive(0)*23 | Active(1) | | | | |
| | | | Text-1(1)*23 | Text-2(2) | Text-3(3) | Text-4(4) | Text-5(5) | |
| On Off Setup | BO | 01xx01 | Stop | Run | | | | *20 |
| On Off State | BI | 01xx02 | Stop | Run | | | | *20 |
| Alarm Signal | BI | 01xx03 | Normal | Error | | | | |
| Error Code | MI | 01xx04 | 01: Normal<br>02: Other errors<br>03: Refrigeration system fault<br>04: Water system error<br>05: Air system error | | 06: Electronic system error<br>07: Sensor fault<br>08: Communication error<br>09: System error | | | |
| Operational Mode Setup | MO | 01xx05 | 01: Cool<br>02: Heat<br>03: Fan | | 04: Auto<br>05: Dry<br>06: Setback | | | *1 *16 *18 *22 |
| Operational Mode State | MI | 01xx06 | 01: Cool<br>02: Heat<br>03: Fan | | 04: Auto<br>05: Dry<br>06: Setback | | | *1 *3 *16 *18 *22 |
| Fan Speed Setup | MO | 01xx07 | 01: Low<br>02: High<br>03: Mid 2 | | 04: Mid 1<br>05: Auto | | | *4 *5 *18 |
| Fan Speed State | MI | 01xx08 | 01: Low<br>02: High<br>03: Mid 2 | | 04: Mid 1<br>05 Auto | | | *4 *5 *18 *21 |
| Room Temp [Water Temp] | AI | 01xx09 | ºF/ºC | | | | | *16 *25 |
| Set Temp [Set Water Temp] | AV | 01xx10 | ºF/ºC | | | | | *16 *25 |
| Filter Sign [Circulating Water Exchange Sign] | BI | 01xx11 | OFF | ON | | | | |
| Filter Sign Reset [Circulating Water Exchange Sign Reset] | BV | 01xx12 | Reset | Void | | | | |
| Prohibition On Off | BV | 01xx13 | Permit | Prohibit | | | | *20 |
| Prohibition Mode | BV | 01xx14 | Permit | Prohibit | | | | *16 |
| Prohibition Filter Sign Reset [Prohibition Circulating Water Exchange Sign Reset] | BV | 01xx15 | Permit | Prohibit | | | | |

| Object | | Object type | Instance number | Units | | | | | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Inactive(0)*23 | Active(1) | | | | |
| | | | | Text-1(1)*23 | Text-2(2) | Text-3(3) | Text-4(4) | Text-5(5) | |
| Prohibition Set Temperature | | BV | 01xx16 | Permit | Prohibit | | | | *16 |
| Prohibition Fan Speed | | BV | 01xx17 | Permit | Prohibit | | | | |
| M-NET Communication State | | BI | 01xx20 | Normal | Error | | | | |
| System Forced Off | individual | BV | 01xx21 | Reset | Execute | | | | *10 *11 |
| | collective | | 019921 | | | | | | |
| Air Direction Setup | | MO | 01xx22 | Horizontal | Downblow 60% | Downblow 80% | Downblow 100% | Swing | *14 *16 *18 |
| Air Direction State | | MI | 01xx23 | Horizontal | Downblow 60% | Downblow 80% | Downblow 100% | Swing | *8 *14 *16 *18 |
| Set Temp Cool | | AV | 01xx24 | ºF/ºC | | | | | *16 *18 |
| Set Temp Heat | | AV | 01xx25 | ºF/ºC | | | | | *16 *18 |
| Set Temp Auto | | AV | 01xx26 | ºF/ºC | | | | | *16 *18 |
| Set High Limit Setback Temp | | AV | 01xx27 | ºF/ºC | | | | | *16 *18 *19 |
| Set Low Limit Setback Temp | | AV | 01xx28 | ºF/ºC | | | | | *16 *18 *19 |
| Ventilation Mode Setup | | MO | 01xx35 | Heat Recovery | Bypass | Auto | | | *15 *18 |
| Ventilation Mode State | | MI | 01xx36 | Heat Recovery | Bypass | Auto | | | *15 *18 *21 |
| Air To Water Mode Setup | | MO | 01xx37 | Heating | Heating ECO | Hot Water | Anti-freeze | Cooling | *15 *16 *17 |
| Air To Water Mode State | | MI | 01xx38 | Heating | Heating ECO | Hot Water | Anti-freeze | Cooling | *15 *16 *17 |
| Group Apportioned Electric Energy | | AC | 01xx39 | 0.1 [kWh] | | | | | *2 |
| Interlocked Units Apportioned Electric Energy | | AC | 61aa39 | 0.1 [kWh] | | | | | *2 *7 |
| PIcontroller Electric Energy 1–4 | | AC | 41mm40–43 | 0.1 [kWh] | | | | | *2 *6 *13 *15 *16 *17 *18 |
| Pulse Input Electric Energy 1–4 | | AC | 410040–43 | 0.1 [kWh] | | | | | *2 *12 *13 *15 *16 *17 *18 |
| Group Apportionment Parameter | | AC | 01xx44 | No Units | | | | | *2 |
| Interlocked Units Apportionment Parameter | | AC | 61aa44 | No Units | | | | | *2 *7 |
| Night Purge State | | BI | 01xx46 | OFF | ON | | | | *15 *18 |
| Thermo On Off State | | BI | 01xx47 | OFF | ON | | | | *16 |
| System Alarm Signal | | BI | 010048 | Normal | Error | | | | |
| Error Code Detail | | AI | 01xx49 | No Units | | | | | |
| External Heat Source State | | BI | 01xx50 | OFF | ON | | | | |
| PIcontroller Alarm Signal | | BI | 41mm03 | Normal | Error | | | | *6 |
| Trend Log Room Temp | | LOG | 01xx80 | | | | | | *9 *16 *24 *25 |

| Object | Object type | Instance number | Units | | | | | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | Inactive(0)*23 | Active(1) | | | | |
| | | | Text-1(1)*23 | Text-2(2) | Text-3(3) | Text-4(4) | Text-5(5) | |
| Trend Log Group Apportioned Electric Energy | LOG | 01xx83 | | | | | | *2 *24 |
| Trend Log Interlocked Units Apportioned Electric Energy | LOG | 61aa83 | | | | | | *2 *7 *24 |
| Trend Log PIcontroller Electric Energy 1–4 | LOG | 41mm84–87 | | | | | | *2 *6 *13 *15 *16 *17 *18 *24 |
| Trend Log Pulse Input Electric Energy 1–4 | LOG | 410084–87 | | | | | | *2 *13 *15 *16 *17 *18 *24 |
| Trend Log Group Apportionment Parameter | LOG | 01xx88 | | | | | | *2 *24 |
| Trend Log Interlocked Units Apportionment Parameter | LOG | 61aa88 | | | | | | *2 *7 *24 |
| Chiller On Off Setup | BO | 71tt01 | OFF | ON | | | | *26 |
| Chiller On Off State | BI | 71tt02 | OFF | ON | | | | |
| Chiller Operational Mode Setup | MO | 71tt03 | Heating | Cooling | Anti-freeze | Heating ECO | | *26 *27 |
| Chiller Operational Mode State | MI | 71tt04 | Heating | Cooling | Anti-freeze | Heating ECO | | |
| Chiller Fan Mode Setup | MO | 71tt05 | Normal | Snow | | | | *26 |
| Chiller Fan Mode State | MI | 71tt06 | Normal | Snow | | | | |
| Chiller Set Temp Cool | AV | 71tt07 | ºC | | | | | *26 |
| Chiller Set Temp Heat | AV | 71tt08 | ºC | | | | | *26 |
| Chiller Representative Inlet Water Temp | AI | 71tt09 | ºC | | | | | |
| Chiller Representative Outlet Water Temp | AI | 71tt10 | ºC | | | | | |
| Chiller Representative Alarm Signal | BI | 71tt11 | Normal | Error | | | | |
| Chiller Communication State | BI | 71tt12 | Normal | Error | | | | |
| Chiller Prohibition On Off | BV | 71tt15 | Permit | Prohibit | | | | |
| Chiller Prohibition Mode | BV | 71tt16 | Permit | Prohibit | | | | |
| Chiller Prohibition Set Temperature | BV | 71tt17 | Permit | Prohibit | | | | |
| Chiller Unit Alarm Signal | BI | 91uu11 | Normal | Error | | | | |

* xx: Group number (01–50)
* mm: PI controller address (01–50)
* aa: Interlocked unit address (01–50)
* tt: Group number of simultaneously operated units including a system representative unit (01–50)
* uu: Unit address (01–50)

*1 “Dry” can be used only when the “Use Dry Mode” setting is enabled (checked) on the BACnet® Setting Tool. (The default setting is disabled (unchecked).)

*2 “Charge” license is required for AE-200/AE-50/EW-50.

*3 When the “Operational Mode State” received from the indoor unit is “Auto Cool”, “Cool” can be selected; when it is “Auto Heat”, “Heat” can be selected, or “Auto” can be selected for both.

*4 “Use Fan Speed Mid1/Mid2” setting of the BACnet® Setting Tool, and effective fan speeds from indoor unit, LOSSNAY, and OA Processing Unit fan speed switching steps are shown in the table below. (The default setting of “Use Fan Speed Mid1/Mid2” of the BACnet® Setting Tool is disabled (unchecked).)
(In the automatic wind velocity compatible model, “Auto” is valid in addition to the fan speed in this table.)

V: Available

| Unit type | “Use Fan Speed Mid1/Mid2” setting | Number of available fan speeds | Available fan speed | | | |
|---|---|---|---|---|---|---|
| | | | Low | Mid 2 | Mid 1 | High |
| Indoor unit | Enabled | 2 | | V | | V |
| | | 3 | | V | V | V |
| | | 4 | V | V | V | V |
| | Disabled | 2–4 | V | | | V |
| LOSSNAY and OA Processing Unit | Enabled | 1 | | | | V |
| | | 2 | V | | | V |
| | | 3 | V | V | | V |
| | | 4 | V | V | V | V |
| | Disabled | 1 | | | | V |
| | | 2–4 | V | | | V |

*5 Low < Mid 2 < Mid 1 < High

*6 mm: PI controller address (01–50)

*7 Can be used only for the interlocked units.
aa: Interlocked unit address (01–50)

*8 When the air direction received from the indoor unit is “Downblow 20%” or “Auto”, “Horizontal” will be output to BACnet®.

*9 The value of the “Present_Value” in the “Room Temp” (AI_01xx09) object is logged in as the log record.

*10 Batch commands are made for the “System Forced Off” instance number (019921) for all groups.

*11 When the “System Forced Off” (individual/collective) from BACnet® communication is used, do not set the “External Input Setting” for AE-200/AE-50/EW-50 to “ON/OFF (Level signal)”. “External Input Setting” can be configured on the Initial Setting Tool, Web Browser for Initial Settings, or AE-200/AE-50’s LCD. (Refer to the AE-200/AE-50/EW-50 Instruction Book (Initial Settings) for settings methods.)

*12 Electric energy for the electricity meter connected to the Pulse Input (PI) of AE-50/EW-50

*13 Electric energy 1 to 4 correspond to signal lines Ch1 to 4 on the PI controller or metering devices 1 to 4 connected to Pulse Input (PI) of AE-50/EW-50.

*14 It may differ from the actual air direction depending on the type of indoor unit (Ceiling-concealed Ducted, Wall-mounted, Floor-standing). An example of a Floor standing PFFY-P VKM-E is as follows.

| | Setting/Status | | | | |
|---|---|---|---|---|---|
| Air direction on the BACnet® | Horizontal | Downblow 60% | Downblow 80% | Downblow 100% | Swing |
| Actual air direction | Upblow 100% | Upblow 80% | Upblow 60% | Horizontal | Swing |

*15 Cannot be used with an indoor unit model.
Differences in supported/not supported objects depending on whether it is an indoor unit, LOSSNAY or the Air To Water model are indicated on the following page.

*16 Cannot be used with a LOSSNAY which is not interlocked with an indoor unit.
Differences in supported/not supported objects depending on whether it is an indoor unit, LOSSNAY or the Air To Water model are indicated on the following page.

*17 Cannot be used with an OA Processing Unit which is not interlocked with an indoor unit.
Differences in supported/not supported objects depending on whether it is an indoor unit, LOSSNAY or the Air To Water model are indicated on the following page.

*18 Cannot be used with an Air To Water model.
Differences in supported/not supported objects depending on whether it is an indoor unit, LOSSNAY or the Air To Water model are indicated on the following page.

*19 It can only be used if the system controller is AE-200A/AE-50A/EW-50A and the indoor unit is a Setback mode supported model.

*20 Do not use this when “External Input Setting” for AE-200/AE-50/EW-50 is set to “ON/OFF (Level signal)”. “External Input Setting” can be configured on the Initial Setting Tool or AE-200/AE-50’s LCD. (Refer to the AE-200/AE-50/EW-50 Instruction Book (Initial Settings) for settings methods.)

*21 During Night Purge state, this operates using a specific fan speed and ventilation mode, but these are not reflected in the status display. As a result, the read status from BACnet® communications may differ from actual fan speeds and ventilation modes. Additionally, carrying out fan speed and ventilation mode settings during Night Purge state will not change actual operation, and these will only be reflected in the status display.

*22 “Setback” is available only when the “Old model compatibility mode” is set to “OFF” on the Initial Setting Tool or AE-200/AE-50’s LCD.

*23 “Inactive(0),Active(1)” is applied when the object type is BO/BI/BV, and “Text-1(1),Text-2(2),⋯” is applied when the object type is MO/MI.

*24 Use the BACnet® Trial Run Tool to check or set the “Log_Interval” property. (Refer to the AE-200/AE-50/EW-50 Instruction Book (BACnet® Trial Run Tool) for settings methods.)

*25 When E-OA model unit is connected, outlet air measurement temperature is used for “Room Temp/Trend Log Room Temp,” and outlet air preset temperature is used for “Set Temp.”

*26 This item is available only when the command input source of the chiller unit is set to the system controller. In such a case, the chiller unit cannot be operated from the remote controller.

*27 The Chiller Operational Mode can be changed when the Chiller On Off is set to Off. Before changing the Chiller Operational Mode Setup, set the Chiller On Off Setup to Off. Wait at least for one minute, check that the Chiller Operational Mode State has been changed as intended, and re-start the operation using the Chiller On Off Setup.

Whether or not the object can be supported by the unit type is indicated in the following table.
The AE-200/AE-50/EW-50 only creates objects supported by each group.

V: Supported
—: Not supported

| Object | | Object type | Instance number | Unit type | | | | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | Indoor unit and OA Processing Unit that is not interlocked with indoor units | LOSSNAY unit that is not interlocked with indoor units | Air To Water | Chiller unit | |
| On Off Setup | | BO | 01xx01 | V | V | V | — | *5 |
| On Off State | | BI | 01xx02 | V | V | V | — | |
| Alarm Signal | | BI | 01xx03 | V | V | V | — | |
| Error Code | | MI | 01xx04 | V | V | V | — | |
| Operational Mode Setup | | MO | 01xx05 | V | — | — | — | |
| Operational Mode State | | MI | 01xx06 | V | — | — | — | |
| Fan Speed Setup | | MO | 01xx07 | V | V | — | — | |
| Fan Speed State | | MI | 01xx08 | V | V | — | — | |
| Room Temp [Water Temp] | | AI | 01xx09 | V | — | V | — | *8 |
| Set Temp [Set Water Temp] | | AV | 01xx10 | V | — | V | — | *2 |
| Filter Sign [Circulating Water Exchange Sign] | | BI | 01xx11 | V | V | V | — | |
| Filter Sign Reset [Circulating Water Exchange Sign Reset] | | BV | 01xx12 | V | V | V | — | |
| Prohibition On Off | | BV | 01xx13 | V | V | V | — | *5 |
| Prohibition Mode | | BV | 01xx14 | V | — | V | — | |
| Prohibition Filter Sign Reset [Prohibition Circulating Water Exchange Sign Reset] | | BV | 01xx15 | V | V | V | — | |
| Prohibition Set Temperature | | BV | 01xx16 | V | — | V | — | |
| Prohibition Fan Speed | | BV | 01xx17 | V | — | — | — | *1 *6 |
| M-NET Communication State | | BI | 01xx20 | V | V | V | — | |
| System Forced Off | individual | BV | 01xx21 | V | V | V | — | |
| | collective | | 019921 | | | | | |
| Air Direction Setup | | MO | 01xx22 | V | — | — | — | *1 |
| Air Direction State | | MI | 01xx23 | V | — | — | — | *1 |
| Set Temp Cool | | AV | 01xx24 | V | — | — | — | *2 |
| Set Temp Heat | | AV | 01xx25 | V | — | — | — | *2 |
| Set Temp Auto | | AV | 01xx26 | V | — | — | — | *2 |
| Set High Limit Setback Temp | | AV | 01xx27 | V | — | — | — | |
| Set Low Limit Setback Temp | | AV | 01xx28 | V | — | — | — | |
| Ventilation Mode Setup | | MO | 01xx35 | V | V | — | — | *3 |
| Ventilation Mode State | | MI | 01xx36 | V | V | — | — | *3 |
| Air To Water Mode Setup | | MO | 01xx37 | — | — | V | — | |

| Object | Object type | Instance number | Unit type | | | | Remarks |
|---|---|---|---|---|---|---|---|
| | | | Indoor unit and OA Processing Unit that is not interlocked with indoor units | LOSSNAY unit that is not interlocked with indoor units | Air To Water | Chiller unit | |
| Air To Water Mode State | MI | 01xx38 | — | — | V | — | |
| Group Apportioned Electric Energy | AC | 01xx39 | V | V | V | — | |
| Interlocked Units Apportioned Electric Energy | AC | 61aa39 | — | — | — | — | *4 |
| PIcontroller Electric Energy 1–4 | AC | 41mm40–43 | — | — | — | — | |
| Pulse Input Electric Energy 1–4 | AC | 410040–43 | — | — | — | — | |
| Group Apportionment Parameter | AC | 01xx44 | V | — | V | — | |
| Interlocked Units Apportionment Parameter | AC | 61aa44 | — | — | — | — | *4 |
| Night Purge State | BI | 01xx46 | V | V | — | — | *3 |
| Thermo On Off State | BI | 01xx47 | V | — | V | — | |
| System Alarm Signal | BI | 010048 | — | — | — | — | |
| Error Code Detail | AI | 01xx49 | V | V | V | — | |
| External Heat Source State | BI | 01xx50 | V | — | — | — | *7 |
| PIcontroller Alarm Signal | BI | 41mm03 | — | — | — | — | |
| Trend Log Room Temp | LOG | 01xx80 | V | — | V | — | |
| Trend Log Group Apportioned Electric Energy | LOG | 01xx83 | V | V | V | — | |
| Trend Log Interlocked Units Apportioned Electric Energy | LOG | 61aa83 | — | — | — | — | *4 |
| Trend Log PIcontroller Electric Energy 1–4 | LOG | 41mm84–87 | — | — | — | — | |
| Trend Log Pulse Input Electric Energy 1–4 | LOG | 410084–87 | — | — | — | — | |
| Trend Log Group Apportionment Parameter | LOG | 01xx88 | V | — | V | — | |
| Trend Log Interlocked Units Apportionment Parameter | LOG | 61aa88 | — | — | — | — | *4 |
| Chiller On Off Setup | BO | 71tt01 | — | — | — | V | |
| Chiller On Off State | BI | 71tt02 | — | — | — | V | |
| Chiller Operational Mode Setup | MO | 71tt03 | — | — | — | V | |
| Chiller Operational Mode State | MI | 71tt04 | — | — | — | V | |
| Chiller Fan Mode Setup | MO | 71tt05 | — | — | — | V | |
| Chiller Fan Mode State | MI | 71tt06 | — | — | — | V | |
| Chiller Set Temp Cool | AV | 71tt07 | — | — | — | V | |
| Chiller Set Temp Heat | AV | 71tt08 | — | — | — | V | |
| Chiller Representative Inlet Water Temp | AI | 71tt09 | — | — | — | V | |
| Chiller Representative Outlet Water Temp | AI | 71tt10 | — | — | — | V | |
| Chiller Representative Alarm Signal | BI | 71tt11 | — | — | — | V | |
| Chiller Communication State | BI | 71tt12 | — | — | — | V | |
| Chiller Prohibition On Off | BV | 71tt15 | — | — | — | V | |
| Chiller Prohibition Mode | BV | 71tt16 | — | — | — | V | |

| Object | Object type | Instance number | Unit type | | | | Remarks |
|---|---|---|---|---|---|---|---|
| | | | Indoor unit and OA Processing Unit that is not interlocked with indoor units | LOSSNAY unit that is not interlocked with indoor units | Air To Water | Chiller unit | |
| Chiller Prohibition Set Temperature | BV | 71tt17 | — | — | — | V | |
| Chiller Unit Alarm Signal | BI | 91uu11 | — | — | — | V | |

*1 An OA Processing Unit which is not interlocked with an indoor unit is not supported.

*2 An example of the temperature setting range for the indoor unit/Air To Water is shown in the following table. (Indicates the setting temperature range of a typical model. May differ depending on the model).

Indoor unit

| Operational mode | | Cool | Heat | Auto | Dry |
|---|---|---|---|---|---|
| Standard model | Auto (Single-set-point) mode | 19–30ºC | 17–28ºC | 19–28ºC | 19–30ºC |
| | Auto (Dual-set-points) mode | 19–35ºC | 4.5–28ºC | Cool: 19–35ºC<br>Heat: 4.5–28ºC | 19–35ºC |
| E-OA model | | 10–24.5ºC | 17–35ºC | 17–24.5ºC | 10–24.5ºC |

Air To Water

| Operational mode | Heating | Heating ECO | Hot Water | Anti-freeze | Cooling |
|---|---|---|---|---|---|
| Booster unit (BU) | 30–50ºC | 30–45ºC | 30–70ºC | 10–45ºC | Invalid |
| HEX unit (AU) | 30–45ºC | 30–45ºC | Invalid | 10–45ºC | 10–30ºC |

(Conversion for communication of the air conditioning equipment and BACnet® is carried out within a range of 0 to 99°C.)

*3 Supported only by LOSSNAY and OA Processing Unit that are not interlocked with indoor units.

*4 Supported by OA Processing Unit that is interlocked with indoor units.

*5 Do not use this when “External Input Setting” for AE-200/AE-50/EW-50 is set to “ON/OFF (Level signal)”. “External Input Setting” can be configured on the Initial Setting Tool or AE-200/AE-50’s LCD. (Refer to the AE-200/AE-50/EW-50 Instruction Book (Initial Settings) for settings methods.)

*6 Can be used when the indoor unit supports “Prohibition Fan Speed”.

*7 Can be used on the unit models produced in April 2012 or later.

*8 When E-OA model unit is connected, outlet air measurement temperature is used.

## 5-3. Set temperature objects

Select the set temperature objects below according to the indoor unit group configuration in a given air conditioning system.

V: Selectable
—: Not selectable

| Object | Object type | Instance number | Models that support the Auto (Dual-set-points) mode *3 | | | Models that do not support the Auto (Dual-set-points) mode *3 |
|---|---|---|---|---|---|---|
| | | | Auto (Single-set-point) mode *1 | Auto (Dual-set-points) mode *1 | Old model compatibility mode *2 | |
| Set Temp | AV | 01xx10 | — | — | V | V |
| Set Temp Cool | AV | 01xx24 | V | V | — | — |
| Set Temp Heat | AV | 01xx25 | V | V | — | — |
| Set Temp Auto | AV | 01xx26 | V | — | — | — |
| Set High Limit Setback Temp | AV | 01xx27 | V*4 | V*4 | — | — |
| Set Low Limit Setback Temp | AV | 01xx28 | V*4 | V*4 | — | — |

*1 Auto (Single-set-point) mode or Auto (Dual-set-points) mode can be set on the local remote controller for each indoor unit. Refer to the indoor unit Instruction Book for details about these modes.

*2 Old model compatibility mode can be collectively set for the M-NET system on the Initial Setting Tool or AE-200/AE-50's LCD. (Refer to the AE-200/AE-50/EW-50 Instruction Book (Initial Settings) for settings methods.)

*3 Selectable/Not selectable of Auto (Dual-set-points) mode is determined automatically for each group. (Group is treated as Auto (Dual-set-points) mode selectable only if all indoor units, all remote controllers, and all system controllers are Auto (Dual-set-points) mode selectable.)

*4 It can only be used if the system controller is AE-200A/AE-50A/EW-50A and the indoor unit is a Setback mode supported model.

*5 When E-OA model unit is connected, outlet air preset temperature is used.

### (1) When the building management system supports two temperature setting (for cooling and heating individually)

Use temperature setting object for "Set Temp" (AV_01xx10) in a group which includes an Auto (Dual-set-points) mode unsupported model.
When operating an Auto (Single-set-point) mode indoor unit in the operation mode "Auto", use the temperature setting object for "Set Temp Auto" (AV_01xx26).
When operating an Auto (Dual-set-points) mode indoor unit in the operation mode "Auto", use the temperature setting object for "Set Temp Cool" (AV_01xx24) and "Set Temp Heat" (AV_01xx25).

### (2) When the building management system supports only one temperature setting (common for cooling and heating)

Set the "Old model compatibility mode" setting to "ON" on the Initial Setting Tool or AE-200/AE-50's LCD.
Use the temperature setting object for "Set Temp" (AV_01xx10).

## 5-4. "System Forced Off" forced-reset function

"System Forced Off (individual/collective)" can be forcibly reset from the BACnet® Setting Tool when it cannot be reset from the building management system due to a problem such as a communication error.

### 5-4-1. "System Forced Off" forced-reset function specifications

When forced-reset of "System Forced Off" is performed, the unit status will be as follows.

| Unit | Status |
|---|---|
| AE-200/AE-50/EW-50 | "System Forced Off (individual/collective)" will all be set to "Reset (Inactive)". |
| Air conditioning unit | Return the prohibition of remote controller operation (ON/OFF) to the state before "System Forced Off" occurs. |

# 5-5. Apportioned electricity billing function

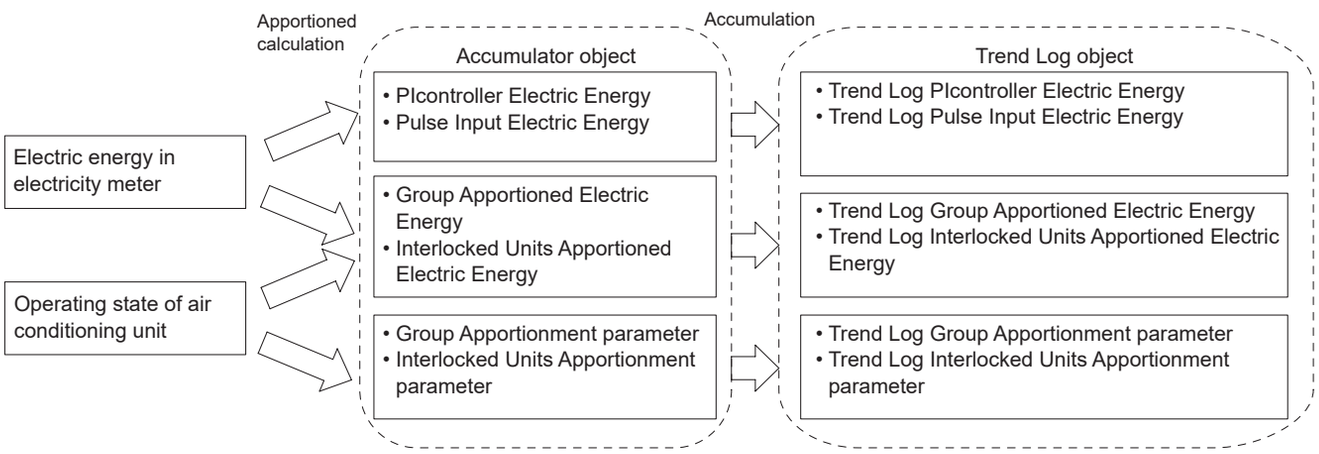
The AE-200/AE-50/EW-50 apportioned electricity billing function calculates the “electric energy for the electricity meter” and the “apportioned electric energy for the electricity meter per group/interlocked unit” or the “apportionment parameters for apportioning the electric energy per group/interlocked unit,” and stores this in the accumulator. Additionally, the accumulator is stored in “Log_Buffer” of the trend log.
The cumulative value and trend log data can be read by BACnet® communication.
BACnet® communications cannot read billing information.
When using the apportioned electricity billing function, a “Charge” license is required for each AE-200/AE-50/EW-50. Refer to the AE-200/AE-50/EW-50 Instruction Book (Apportioned Electricity Billing Function) for details on the apportioned electricity billing function.
When using the apportioned electricity billing function, refer to (3) “When using an apportioned electricity billing function” in section 3-1 “Sample system configurations” for system configuration.

## 5-5-1. Apportioned electricity billing function specifications

The apportioned electricity billing function in the BACnet® function is configured of an accumulator object which stores the electric energy and other cumulative value/apportioned results cumulative value and the trend log object which reads the accumulator for each fixed time and accumulates the value. When using the apportioned electricity billing function, a “Charge” license is required.

Note

An interlocked unit is an OA Processing Unit (FU attribute) linked to an indoor unit, and covers those affiliated OA Processing Units that can be registered in the energy management block settings of the Initial Setting Tool.
This does not refer to an OA Processing Unit (IC attribute) that is not linked to an indoor unit that can have group settings performed through the centralized controller.
Chiller unit does not support the apportioned electricity billing function.


Apportioned calculation
Accumulation
Accumulator object
Trend Log object
Electric energy in electricity meter
Operating state of air conditioning unit
• PIcontroller Electric Energy
• Pulse Input Electric Energy
• Group Apportioned Electric Energy
• Interlocked Units Apportioned Electric Energy
• Group Apportionment parameter
• Interlocked Units Apportionment parameter
• Trend Log PIcontroller Electric Energy
• Trend Log Pulse Input Electric Energy
• Trend Log Group Apportioned Electric Energy
• Trend Log Interlocked Units Apportioned Electric Energy
• Trend Log Group Apportionment parameter
• Trend Log Interlocked Units Apportionment parameter

Accumulator specifications

| Data type | Apportioning type | Contents *3 |
|---|---|---|
| Electric energy *1 *4 | Apportionment source | Cumulative electric energy from electricity meter read from PI controller |
| | | Cumulative electric energy from electricity meter read from built-in Pulse Input (PI) of AE-50/EW-50 |
| | Apportioned results | Electric energy for each group (indoor unit + outdoor unit) *5 |
| | | Electric energy for each interlocked unit (indoor unit + outdoor unit) *5 |
| Apportionment parameter *2 *4 *6 | Apportionment parameter | Apportionment parameters for each group (for outdoor units) *5 |
| | | Apportionment parameters for each interlocked unit (for outdoor units) *5 |

*1 Electricity meter must be connected to obtain the electric energy. Also, apportionment calculation is carried out using AE-200 for dedicated electricity apportionment.
*2 The electricity meter need not be connected to obtain the apportionment parameters. Select when carrying out apportionment calculations in a building management system.
*3 Cumulative data for 30 minute cycles. (Data for until XX:00 and XX:30 minutes is updated at XX:15 and XX:45 respectively)
*4 The value can be compensated by writing the value in the “Value_Set” of the accumulator object.
*5 Stores apportionment results by the apportionment method set in the billing function settings for the apportioned electricity billing function.
*6 The apportionment parameter is a value that is proportionate to the electric energy consumption calculated based on the operation status and operation time of each air conditioning unit, and will be the reference value for separately-calculating the electric energy (or electricity charge) using the ratio of this value and the total value of apportionment parameters for all units.

Trend log specifications (only for portions related to the apportioned electricity billing function)

| Item | Setting contents | Setting method |
|---|---|---|
| Collection cycle | 30 minutes to 1440 minutes (1 day)<br>Can be set in 30-minute increments.<br>(“Log_Interval” property)<br>Initial value: 30 minutes | Settings on the building management system |
| Collection period | 4 days*1 to 192 days*2<br>(retain the value for the most recent 192 items) | |
| Collection timing | Carry out collection for each collection cycle using 1970/1/1 00:00:00 as a starting point. | |
| Collection starts | After participation sequence completed (Status = Operational) | |
| Log deleted | When “0” is written to the “Record_Count” property | |

*1 When the collection cycle is 30 minutes

*2 When the collection cycle is 1 day

## 5-5-2. Accumulator object

The instance number of the accumulator object which stores the cumulative value is as follows.

| Object | Object type | Instance number | Apportioning type | Metering device | Contents |
|---|---|---|---|---|---|
| Group Apportioned Electric Energy | AC | 01xx39 | Apportioned results | Required | Stores the cumulative value of the electric energy (indoor unit + outdoor unit) for each group. |
| Interlocked Units Apportioned Electric Energy | AC | 61aa39 | | | Stores the cumulative value of the electric energy (indoor unit + outdoor unit) for each interlocked unit (OA Processing Unit). |
| PIcontroller Electric Energy 1–4 | AC | 41mm40–43 | Apportionment source data | | Cumulative value (for 4 channels) of electric energy accumulated in PI controller |
| Pulse Input Electric Energy 1–4 | AC | 410040–43 | | | Cumulative value (for 4 channels) of electric energy accumulated in a built-in Pulse Input (PI) of AE-50/EW-50 |
| Group Apportionment Parameter | AC | 01xx44 | Apportionment parameter | Not required | Stores electric energy apportionment parameters (for outdoor units) for each group. |
| Interlocked Units Apportionment Parameter | AC | 61aa44 | | | Stores electric energy apportionment parameters (for outdoor units) for each interlocked unit (OA Processing Unit). |

* xx: Group number (01–50)

* mm: PI controller address (01–50)

* aa: Interlocked unit address (01–50)

## 5-5-3. Trend log object

Instance number of the trend log object (only the portion related to the apportioned electricity billing function) which stores the accumulator log is as follows.

| Object | Object type | Instance number | Apportioning type | Metering device | Contents |
|---|---|---|---|---|---|
| Trend Log Group Apportioned Electric Energy | LOG | 01xx83 | Apportioned results | Required | Accumulates “Present_Value” of accumulator (Group Apportioned Electric Energy) for each collection cycle. |
| Trend Log Interlocked Units Apportioned Electric Energy | LOG | 61aa83 | | | Accumulates “Present_Value” of accumulator (Interlocked Units Apportioned Electric Energy) for each collection cycle. |
| Trend Log PIcontroller Electric Energy 1–4 | LOG | 41mm84–87 | Apportionment source data | | Accumulates “Present_Value” of accumulator (PIcontroller Electric Energy 1–4) for each collection cycle. |
| Trend Log Pulse Input Electric Energy 1–4 | LOG | 410084–87 | | | Accumulates “Present_Value” of accumulator (Pulse Input Electric Energy 1–4) for each collection cycle. |
| Trend Log Group Apportionment parameter | LOG | 01xx88 | Apportionment parameter | Not required | Accumulates “Present_Value” of accumulator (Group Apportionment parameter) for each collection cycle. |
| Trend Log Interlocked Units Apportionment Parameter | LOG | 61aa88 | | | Accumulates “Present_Value” of accumulator (Interlocked Units Apportionment Parameter) for each collection cycle. |

* xx: Group number (01–50)
* mm: PI controller address (01–50)
* aa: Interlocked unit address (01–50)

Note

If the apportioned electricity billing function is enabled and the power to the AE-200/AE-50/EW-50 is turned on between 10 and 15, or between 40 and 45 minutes every hour, then when accumulator objects and trend log objects are first collected, the object “Reliability” property may be other than “0” (indicating no reliability).

## 5-5-4. System restrictions for apportioned electricity billing function

- “Charge” license is required for each AE-200/AE-50/EW-50.
- Combinations of AE-200 and AE-50/EW-50 units are required.
- M-NET of AE-200 for billing function cannot be used.
- Built-in Pulse Input (PI) of AE-200 for billing function cannot be used.
- Electric energy measurement using a PI controller is recommended.
  (If AE-50/EW-50 with built-in Pulse Input (PI) is used, pulse input will not be possible when the AE-50/EW-50 is stopped, during power outages or during software updates. This could result in discrepancies between the measurements and the actual electric energy consumed.)
- Ensure that the same software versions are used on AE-200/AE-50/EW-50 units.
- The apportioned electricity billing function (AE-200 Apportion) and apportioned electricity billing function (TG-2000A Apportion) cannot be used together.
- When the apportioned electricity billing function (AE-200 Apportion) is being used and you intend to use the TG-2000A integration software, check that the TG-2000A version is 6.60 or later.
- An electricity meter is required for each AE-200 and for each AE-200 system comprising expansion controller AE-50/EW-50. You cannot make settings (apportionment settings) that span multiple AE-200 systems.

## 5-5-5. Notes on using the apportioned electricity billing function

- This function is our original electric energy apportionment system that apportions electric energy using input from electricity meters with a pulse generator function. Rather than directly measuring the electric energy consumed by each air conditioner, pulses are input based on the air conditioner usage by determining the air conditioner operating status from the content of its communication with the indoor and outdoor units.

**To all users (user license agreement)**

**The information provided here constitutes an agreement between Mitsubishi Electric and the customer.**
**If this "apportioned electricity billing function for the AE-200 air conditioning control system" is used, this agreement assumes that the customer is using the aforementioned system having agreed to the terms listed below.**

- **Mitsubishi Electric and its sales companies accept no liability whatsoever for any incidental, consequential or special damages incurred by the customer, even where the sales company has received notification of the potential for damages of that kind.**
  **Nor is any liability accepted for any allegations regarding the rights of a third party.**

Important

**Any individual agreement between the building owner and a tenant regarding the use of this product should incorporate the parties' agreement to or accord with the fact that "charges for the use of air conditioning will be collected in the form of apportioned totals based on the operating status of air conditioners (including temporary measures to deal with faults)".**

- **This is a system for estimating the operating electric energy consumed for air conditioning. As such it cannot be used as a proof of transaction.**
  **Also, amounts metered using electricity meters are also counted using pulse conversion and cannot be used as a proof of transaction.**
- This is not a system (or its equivalent) in which the operating electric energy consumed by each air conditioner is directly measured at the location where the electricity is supplied.
- Because this is an apportionment method that uses the operating status of air conditioner indoor units, even where the operating time for indoor units is the same, the amount of operating electric energy consumed may differ depending on the model configuration and operating status of the outdoor units. (The apportioned electric energy may be different when compared with a situation where an electricity meter is assigned to each air conditioner.)
- Air conditioners still receive current even when stopped, and electric energy is apportioned to idle air conditioners as standby electric energy.
- **While the amounts of electric energy, water and gas consumed are obtained through pulse conversion, factors such as performance and accuracy are dependent on the metering devices and Mitsubishi Electric is in no way responsible for such factors.**
- If electric power to the AE-200/AE-50/EW-50 and PI controller is interrupted due to a power outage but the air conditioner is still running, electric energy cannot be apportioned correctly.
- Because the unit price digits for each tenant (energy management block) are rounded off in the charge calculation process, the figures may differ from the total electric energy charges.
- Adjust the time in the following method as there are discrepancies in the results of apportionment processing when there is a time lag.
  When there is no connection to BACnet® or when time synchronization is not carried out from the building management system, perform periodic time adjustment on the AE-200's LCD. (Even if time is adjusted with AE-50/EW-50, it is overwritten with the time of AE-200.)
  To perform date and time synchronization from the building management system with connection to BACnet®, set the "Time Master/Sub" setting to "Sub" on the AE-200 for billing function. The "Time Master/Sub" setting can be made on the Initial Setting Tool or AE-200/AE-50's LCD. (Refer to the AE-200/AE-50/EW-50 Instruction Book (Initial Settings) for settings methods.)
- Mitsubishi Electric accepts no liability for the incorrect apportionment of electric energy due to problems such as power outages or equipment faults.

# 5-6. Alarm Signal

Error status of the AE-200/AE-50/EW-50 and of air conditioning units connected to the AE-200/AE-50/EW-50 can be read from the building management system.

## 5-6-1. Alarm signal for object

Error causes and corresponding alarm objects are shown below.

V: Supported

| Error cause | | Supported object | | | | | |
|---|---|---|---|---|---|---|---|
| | | Alarm Signal (BI_01xx03) | Error Code (MI_01xx04) | Error Code Detail (AI_01xx49) | M-NET Communication State (BI_01xx20) | System Alarm Signal (BI_010048) | PIcontroller Alarm Signal (BI_41mm03) |
| Equipment error | AE-200/AE-50/EW-50 error | | | | | V | |
| | Air conditioning unit error | V | V | V | | | |
| | PI controller error | | | | | | |
| | ME remote controller or system controller error | | | | | | |
| M-NET communication error | AE-200/AE-50/EW-50 communication error, M-NET address overlap (Error code: 6600–6603) | V *1 | V | V | V | V | V |
| | Communication error with air conditioning unit (Error code: 6606–6608) *3 | V *1 | V | V | V | | |
| | Communication error with PI controller (Error code: 6606–6608) | | | | | | V *2 |
| | Communication error with ME remote controller or system controller (Error code: 6606–6608) | | | | | | |
| LAN communication error | LAN1 communication error of AE-200/AE-50/EW-50 (Communication error between AE-200 and expansion controller) | | | | | V | |
| | LAN2 (BACnet®) communication error of AE-200/AE-50/EW-50 | | | | | | |

* xx: Group number (01–50)

* mm: PI controller address (01–50)

*1 Only when “Not reflect communication error to alarm signal” setting on the BACnet® Setting Tool is unchecked

*2 The PI controller is not subject to group settings, therefore this is not included in the Alarm Signal (BI_01xx03).

*3 If the communication error is still displayed on the remote controller after the communication error is corrected and the supported objects resume normal operation, stop the operation of the air conditioning unit to clear the error display.

## 5-6-2. Alarm signal for chiller object

The table below lists the error causes and the supported alarm objects for the chiller unit.

V: Supported

| Error cause | | Supported object | | |
|---|---|---|---|---|
| | | Chiller Representative Alarm Signal (BI_71tt11) | Chiller Communication State (BI_71tt12) | Chiller Unit Alarm Signal (BI_91uu11) |
| Equipment error | Chiller unit error (by system) | V | | |
| | Chiller unit error (by unit) | | | V |
| M-NET communication error | Communication error with chiller unit (Error code: 6606–6608) | V *1 *2 | V *2 | V *1 |

* tt: Group number of simultaneously operated units including a system representative unit (01–50)

* uu: Unit address (01–50)

*1 Only when “Not reflect communication error to alarm signal” setting on the BACnet® Setting Tool is unchecked

*2 A communication error is issued when even one of the chiller units in the system has a communication error.

# 5-7. Event service specifications

The table below shows the supported notifications for each object.
Notification settings can be made on the BACnet® Setting Tool.

## 5-7-1. Event service of objects

The availability of the notification setting in BACnet® Setting Tool for each object is shown in the following table.

V: Notification can be set on the BACnet® Setting Tool.
—: Notification cannot be set.

| Object | | Object ID | Event Notification | COV Notification | Remarks |
|---|---|---|---|---|---|
| On Off Setup | | BO_01xx01 | V | V | *4 |
| On Off State | | BI_01xx02 | V | V | |
| Alarm Signal | | BI_01xx03 | V *1 | V | |
| Error Code | | MI_01xx04 | — | V | |
| Operational Mode Setup | | MO_01xx05 | — | V | |
| Operational Mode State | | MI_01xx06 | — | V | |
| Fan Speed Setup | | MO_01xx07 | — | V | |
| Fan Speed State | | MI_01xx08 | — | V | |
| Room Temp<br>[Water Temp] | | AI_01xx09 | V | V | |
| Set Temp<br>[Set Water Temp] | | AV_01xx10 | — | V | |
| Filter Sign<br>[Circulating Water Exchange Sign] | | BI_01xx11 | V | V | |
| Filter Sign Reset<br>[Circulating Water Exchange Sign Reset] | | BV_01xx12 | — | V | |
| Prohibition On Off | | BV_01xx13 | — | V | *4 |
| Prohibition Mode | | BV_01xx14 | — | V | |
| Prohibition Filter Sign Reset<br>[Prohibition Circulating Water Exchange Sign Reset] | | BV_01xx15 | — | V | |
| Prohibition Set Temperature | | BV_01xx16 | — | V | |
| Prohibition Fan Speed | | BV_01xx17 | — | V | |
| M-NET Communication State | | BI_01xx20 | V | V | |
| System Forced Off | individual | BV_01xx21 | — | V | |
| | collective | BV_019921 | | | |
| Air Direction Setup | | MO_01xx22 | — | V | |
| Air Direction State | | MI_01xx23 | — | V | |
| Set Temp Cool | | AV_01xx24 | — | V | |
| Set Temp Heat | | AV_01xx25 | — | V | |
| Set Temp Auto | | AV_01xx26 | — | V | |
| Set High Limit Setback Temp | | AV_01xx27 | — | V | |
| Set Low Limit Setback Temp | | AV_01xx28 | — | V | |
| Ventilation Mode Setup | | MO_01xx35 | — | V | |
| Ventilation Mode State | | MI_01xx36 | — | V | |
| Air To Water Mode Setup | | MO_01xx37 | — | V | |
| Air To Water Mode State | | MI_01xx38 | — | V | |
| Group Apportioned Electric Energy | | AC_01xx39 | V | — | |
| Interlocked Units Apportioned Electric Energy | | AC_61aa39 | V | — | |
| PIcontroller Electric Energy 1–4 | | AC_41mm40–43 | V | — | |
| Pulse Input Electric Energy 1–4 | | AC_410040–43 | V | — | |
| Group Apportionment Parameter | | AC_01xx44 | V | — | |

| Object | Object ID | Event Notification | COV Notification | Remarks |
|---|---|---|---|---|
| Interlocked Units Apportionment Parameter | AC_61aa44 | V | — | |
| Night Purge State | BI_01xx46 | V | V | |
| Thermo On Off State | BI_01xx47 | V | V | |
| System Alarm Signal | BI_010048 | V *2 | V | |
| Error Code Detail | AI_01xx49 | — | V | |
| External Heat Source State | BI_01xx50 | V | V | |
| PIcontroller Alarm Signal | BI_41mm03 | V *3 | V | |
| Trend Log Room Temp | LOG_01xx80 | — | — | |
| Trend Log Group Apportioned Electric Energy | LOG_01xx83 | — | — | |
| Trend Log Interlocked Units Apportioned Electric Energy | LOG_61aa83 | — | — | |
| Trend Log PIcontroller Electric Energy 1–4 | LOG_41mm84–87 | — | — | |
| Trend Log Pulse Input Electric Energy 1–4 | LOG_410084–87 | — | — | |
| Trend Log Group Apportionment Parameter | LOG_01xx88 | — | — | |
| Trend Log Interlocked Units Apportionment Parameter | LOG_61aa88 | — | — | |
| Notification Class | CLS_xxxxxx | — | — | xxxxxx: Notification class ID |
| Device | DEV_xxxxxx | — | — | xxxxxx: Device No. |
| CH_OnOffSetup | BO_71tt01 | V | V | |
| CH_OnOffState | BI_71tt02 | V | V | |
| CH_OperationModeSetup | MO_71tt03 | — | V | |
| CH_OperationModeState | MI_71tt04 | V | V | |
| CH_FanModeSetup | MO_71tt05 | — | V | |
| CH_FanModeState | MI_71tt06 | V | V | |
| CH_SetTempCool | AV_71tt07 | — | V | |
| CH_SetTempHeat | AV_71tt08 | — | V | |
| CH_ReprInletWaterTemp | AI_71tt09 | V | V | |
| CH_ReprOutletWaterTemp | AI_71tt10 | V | V | |
| CH_ReprAlarmSignal | BI_71tt11 | V | V | |
| CH_CommunicationState | BI_71tt12 | V | V | |
| CH_ProhibitionOnOff | BV_71tt15 | — | V | |
| CH_ProhibitionMode | BV_71tt16 | — | V | |
| CH_ProhibitionSetTemp | BV_71tt17 | — | V | |
| CH_UnitAlarmSignal | BI_91uu11 | V | V | |

* xx: Group number (01–50)
* mm: PI controller address (01–50)
* aa: Interlocked unit address (01–50)
* tt: Group number of simultaneously operated units including a system representative unit (01–50)
* uu: Unit address (01–50)

*1 Air conditioning unit error code (4 digits) will be output to “MessageText”.

*2 Error code (4 digits) will be output to “MessageText”.

*3 PI controller error code (4 digits) will be output to “MessageText”.

*4 Do not use this when “External Input Setting” for AE-200/AE-50/EW-50 is set to “ON/OFF (Level signal)”. “External Input Setting” can be configured on the Initial Setting Tool or AE-200/AE-50’s LCD. (Refer to the AE-200/AE-50/EW-50 Instruction Book (Initial Settings) for settings methods.)

## 5-8. BACnet® information and storage timing/cycle in nonvolatile memory within the AE-200/AE-50/EW-50

The following BACnet® information (object property value) is stored in nonvolatile memory inside AE-200/AE-50/EW-50 for each storage timing or cycle in the table below.
After the property value has been updated, if the power source for AE-200/AE-50/EW-50 is cut within the storage cycle and when restart is carried out, it may return to the property value before updating.

| Object | Object ID | Property | Storage timing or cycle |
|---|---|---|---|
| On Off State<br>Thermo On Off State<br>Chiller On Off State<br>External Heat Source State | BI_01xx02<br>BI_01xx47<br>BI_71tt02<br>BI_01xx50 | Present_Value | 60 minutes *1 |
| Room Temp<br>Chiller Representative Inlet Water Temp<br>Chiller Representative Outlet Water Temp | AI_01xx09<br>AI_71tt09<br>AI_71tt10 | High_Limit | When updated *3 |
| | | Low_Limit | When updated *3 |
| | | Deadband | When updated *3 |
| | | Limit_Enable | When updated *3 |
| Group Apportioned Electric Energy<br>Interlocked Units Apportioned Electric Energy<br>PIcontroller Electric Energy 1–4<br>Pulse Input Electric Energy 1–4<br>Group Apportionment Parameter<br>Interlocked Units Apportionment Parameter | AC_01xx39<br>AC_61aa39<br>AC_41mm40–43<br>AC_410040–43<br>AC_01xx44<br>AC_61aa44 | Present_Value | 30 minutes *2 |
| | | Value_Change_Time | When updated *3 |
| | | Value_Before_Change | When updated *3 |
| | | Value_Set | When updated *3 |
| | | Pulse_Rate | 30 minutes *2 |
| | | High_Limit | When updated *3 |
| | | Low_Limit | When updated *3 |
| | | Limit_Enable | When updated *3 |
| Trend Log Room Temp | LOG_01xx80 | Enable | When updated *3 |
| | | Start_Time | When updated *3 |
| | | Stop_Time | When updated *3 |
| | | Log_Interval | When updated *3 |
| Trend Log Group Apportioned Electric Energy<br>Trend Log Interlocked Units Apportioned Electric Energy<br>Trend Log PIcontroller Electric Energy 1–4<br>Trend Log Pulse Input Electric Energy 1–4<br>Trend Log Group Apportionment Parameter<br>Trend Log Interlocked Units Apportionment Parameter | LOG_01xx83<br>LOG_61aa83<br>LOG_41mm84–87<br>LOG_410084–87<br>LOG_01xx88<br>LOG_61aa88 | Enable | When updated *3 |
| | | Start_Time | When updated *3 |
| | | Stop_Time | When updated *3 |
| | | Log_Interval | When updated *3 |
| | | Record_Count | When updated *3 |
| | | Total_Record_Count | When updated *3 |
| | | Log_Buffer | When updated *3 |
| Device | DEV_xxxxxx | Object_Name | When updated *3 |
| | | Active_COV_Subscriptions | |
| Notification Class | CLS_xxxxxx | Recipient_List | When updated *3 |

*1 At XX:05 minutes every hour

*2 At XX:15 minutes and XX:45 minutes every hour

*3 Will be saved within 1 minute after the property value is updated.

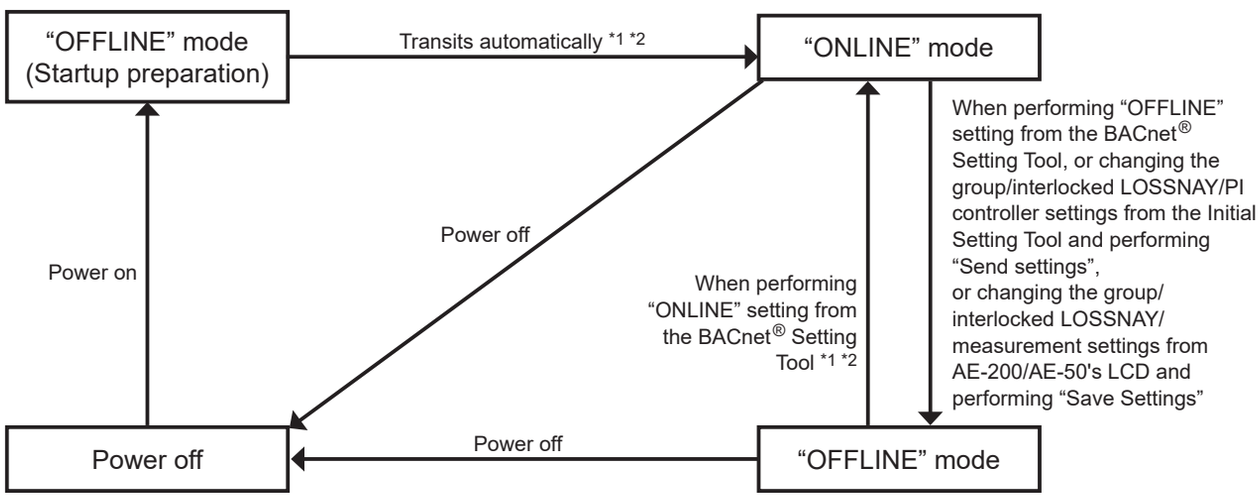
# 6. Usage (AE-200/AE-50/EW-50 BACnet® connection mode)

## 6-1. AE-200/AE-50/EW-50 BACnet® connection mode

The AE-200/AE-50/EW-50 BACnet® function operates in the following two connection modes.

| Mode name | Details |
|---|---|
| “ONLINE” mode | This is a mode while operating which carries out BACnet® communication. |
| “OFFLINE” mode | This is a mode while maintenance and settings in which BACnet® communication does not occur. |

Transition of “ONLINE” and “OFFLINE” mode is as follows.
The current mode can be checked using the BACnet® Setting Tool or the BACnet® ONLINEOFFLINE Confirmation Tool.


“OFFLINE” mode
(Startup preparation)
Transits automatically *1 *2
“ONLINE” mode
When performing “OFFLINE” setting from the BACnet® Setting Tool, or changing the group/interlocked LOSSNAY/PI controller settings from the Initial Setting Tool and performing “Send settings”, or changing the group/ interlocked LOSSNAY/ measurement settings from AE-200/AE-50's LCD and performing “Save Settings”
Power off
Power on
When performing “ONLINE” setting from the BACnet® Setting Tool *1 *2
Power off
Power off
“OFFLINE” mode

*1 Does not switch to the “ONLINE” mode in the following cases:
- When a valid “BACnet connection” license is not registered
- When inconsistency occurs in BACnet® settings information, or before reflecting the first BACnet® settings
- When the metering device is registered in the AE-200/AE-50/EW-50 “Measurement” settings or “PI Controller” settings, and the corresponding BACnet® accumulator object (PIcontroller Electric Energy 1–4, Pulse Input Electric Energy 1–4) is not enabled (Even if the target accumulator object is not required, enable it. “Measurement” settings can be configured on the AE-200/AE-50’s LCD, and “PI Controller” settings can be configured on the Initial Setting Tool. Refer to the AE-200/AE-50/EW-50 Instruction Book (Initial Settings) for settings methods.)

*2 When there are many setting groups, the time to migration to “ONLINE” mode gets longer. (maximum of approximately 10 minutes)

# 7. Checking installation operations and performing trial run

For air conditioning system designs before initial settings, consult your dealer.

## 7-1. Flow of initial settings

In general, the initial settings are largely divided into 4 steps as follows.
By making initial settings along these 4 steps, the cause classification in case of trouble is clarified in each step and the initial settings can be advanced efficiently.

Make the initial settings according to the following procedures.

**Step-1 Initial settings for the air conditioning system**

Make the system setting of AE-200/AE-50/EW-50 and unit setting of the air conditioning system and chiller unit, and register the required licenses. This is also a step to make initial settings other than for the apportioned electricity billing function and BACnet® functions.
(Refer to the AE-200/AE-50/EW-50 Instruction Book (Initial Setting) for making the system setting of AE-200/AE-50/EW-50 and the unit setting of the air conditioning system, and registering the licenses.)

⇩

**Step-2 Trial run of the air conditioning system**

Check to see that the air conditioning unit, chiller unit, and controller, etc. have the correct system configuration or to see that the air conditioning unit and chiller unit are operating normally. (Refer to AE-200/AE-50/EW-50 Installation Manual for the method of trial run.)

When not using an apportioned electricity billing function ⇩

When using an apportioned electricity billing function ⇩

**Initial settings for apportioned electricity billing function**

Make initial settings for the apportioned electricity billing function.
(Refer to the AE-200/AE-50/EW-50 Instruction Book (Apportioned Electricity Billing Function) for initial settings procedures for apportioned electricity billing function.)

⇩

**Step-3 Initial settings for the BACnet® related items**

Using the BACnet® Setting Tool, make settings related to BACnet® of AE-200/AE-50/EW-50.
(For BACnet® related settings, refer to the AE-200/AE-50/EW-50 Instruction Book (BACnet® Setting Tool).)

When not using an apportioned electricity billing function ⇩

When using an apportioned electricity billing function ⇩

**Trial run of apportioned electricity billing function**

Carry out a trial run of an apportioned electricity billing function.
(Refer to the AE-200/AE-50/EW-50 Instruction Book (Apportioned Electricity Billing Function) and the AE-200/AE-50/EW-50 Instruction Book (BACnet® Apportioned Electricity Billing Function Trial Run) for trial run procedures.)

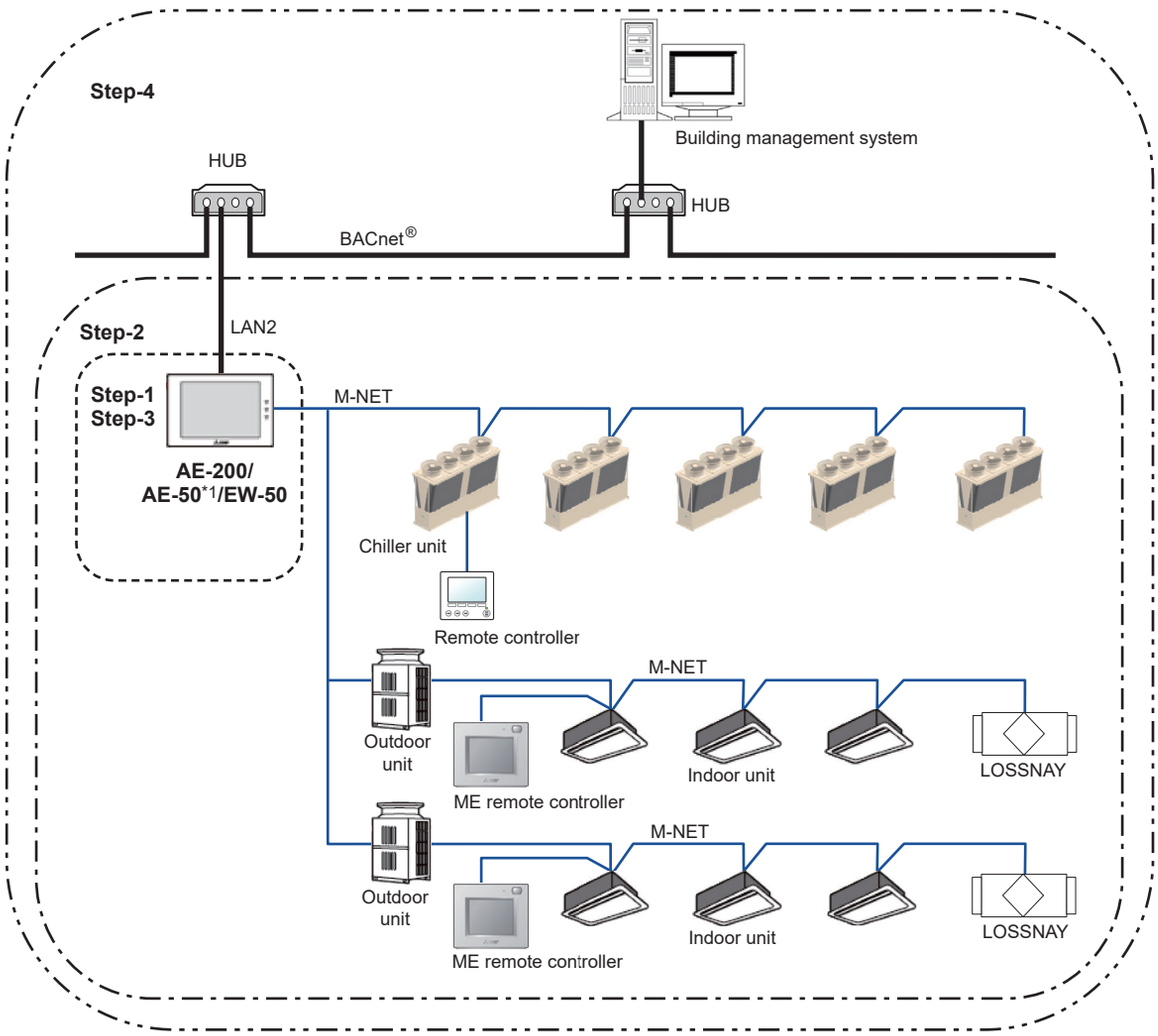
⇩

These steps (excluding the BACnet® apportioned electricity billing function trial run for accumulator objects and their trend log objects) can be reversed.

**Step-4 Trial run of BACnet® function**

Check that the operational status and alarms for air conditioning units and chiller units are being displayed and reported correctly in the BACnet® Trial Run Tool; that the air conditioning units are operating in accordance with operation or settings from the BACnet® Trial Run Tool.

Connection image after completion of initial settings and work scope of each step




*1 AE-50 is used only for monitoring multiple M-NET systems from a single AE-200 or for using the apportioned electricity billing function.

## 7-2. Preparatory items for initial settings

Prepare the following equipment and materials to make initial settings and trial run.

| Item | Contents | Q'ty | Remarks |
|---|---|---|---|
| Required material | Diagram of air conditioning control system for building | 1 | Group configuration and IP address etc. |
| | Others *2 | - | BACnet® devices list, notification items, documents related to notification destination and notification methods |
| Manual | AE-200/AE-50/EW-50 Instruction Book (BACnet® function) | 1 | (This manual) |
| | AE-200/AE-50/EW-50 Instruction Book (Initial Settings) | 1 | |
| | AE-200/AE-50/EW-50 Instruction Book (BACnet® Setting Tool) | 1 | |
| | AE-200/AE-50/EW-50 Installation Manual | 1 | Included with AE-200/AE-50/EW-50 |
| | AE-200/AE-50/EW-50 Instruction Book (Apportioned Electricity Billing Function) | 1 | Used only when the apportioned electricity billing function is used. |
| | Instruction Book and Installation Manual of each air conditioning unit and controller | 1 | |
| Device/ equipment | PC *1 | 1 | Used for operating Web browser/Initial Setting Tool/BACnet® Setting Tool |
| | BACnet® Setting Tool *3 | 1 | |
| | BACnet® ONLINEOFFLINE Confirmation Tool | 1 | |
| | BACnet® Trial Run Tool | 1 | Used for BACnet® trial run and log interval setting of the trend log. |
| | “BACnet connection” license | 1 | Consult your dealer for details. |
| | “Charge” license | 1 | Used only when the apportioned electricity billing function is used. Consult your dealer for details. |
| | Switching HUB | 2 | Used for connecting Initial Setting Tool/BACnet® Setting Tool |
| | LAN cable (Category 5 or above straight cable) | 2 | Used for connecting Initial Setting Tool/BACnet® Setting Tool |
| | General tools such as a screwdriver | 1 | |
| | Tester | 1 | Used for checking wiring and voltage |

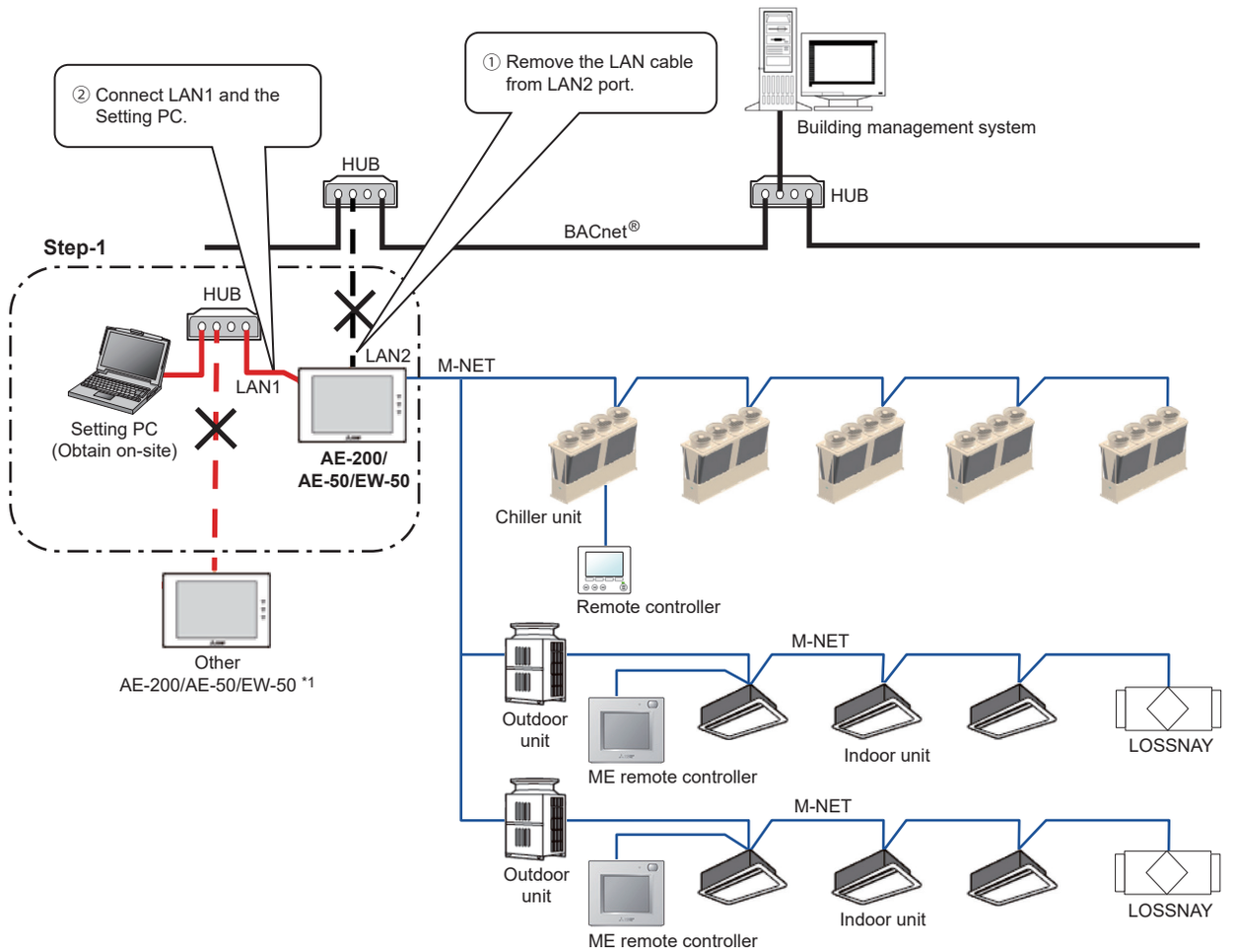
*1 Refer to the AE-200/AE-50/EW-50 Instruction Book (Initial Settings) and the AE-200/AE-50/EW-50 Instruction Book (BACnet® Setting Tool) for required specs, etc.

*2 When using the apportioned electricity billing function, materials and machine parts are required to configure the apportioned electricity billing function. Refer to the AE-200/AE-50/EW-50 Instruction Book (Apportioned Electricity Billing Function) for details.

*3 BACnet® Setting Tool installer includes BACnet® Setting Tool and Initial Setting Tool.

# 7-3. Step-1 Initial settings for the air conditioning system

Make initial settings for the AE-200/AE-50/EW-50 using the Initial Setting Tool. Refer to the AE-200/AE-50/EW-50 Instruction Book (Initial Settings) for details.




*1 If the LAN1 connection between AE-200/AE-50/EW-50 is disconnected, then a communication error (6920) may be detected. In this process, ignore the communication error (6920).

### (1) Setting Tool installation

Install the Initial Setting Tool and BACnet® Setting Tool on the Setting PC, and set the IP address for the Setting PC.
(Refer to the AE-200/AE-50/EW-50 Instruction Book (Initial Settings) and the AE-200/AE-50/EW-50 Instruction Book (BACnet® Setting Tool) for details.)

### (2) Connecting the Setting PC

Before connecting the Setting PC to AE-200/AE-50/EW-50, remove the LAN cable connected to BACnet® from LAN2 of AE-200/AE-50/EW-50.
AE-200/AE-50/EW-50 (LAN1) and the Setting PC are connected via a HUB.

### (3) Setting IP address

Make settings related to the IP address of LAN1 of AE-200/AE-50/EW-50 on the AE-200/AE-50's LCD. (Refer to the AE-200/AE-50/EW-50 Instruction Book (Initial Settings) for the setting method.)
The settings can also be made using the Initial Setting Tool or the Quick IP address setting switch (EW-50 only, IP address only).

The settings that can be made on the AE-200/AE-50's LCD are as follows.

| No. | Main tab | Sub tab |
|---|---|---|
| 1 | Initial Settings | Network |
| 2 | | Unit information |

### (4) Software version upgrades, expansion controller setting, license registration, time settings

Upgrade the software versions to unify the software versions of all connected AE-200/AE-50/EW-50.
Configure the settings related to the expansion controllers on the LCD of AE-200/AE-50.
Register the license to use with the AE-200/AE-50/EW-50.
Set the AE-200/AE-50/EW-50 time.
(Refer to the AE-200/AE-50/EW-50 Instruction Book (Initial Settings) for settings methods.)

### (5) Basic settings, unit settings, and floor settings

Configure settings related to the air conditioning system using the Initial Setting Tool which has been installed on the Setting PC.
Items to be set are as follows.
(For the setting method, refer to the AE-200/AE-50/EW-50 Instruction Book (Initial Settings).)

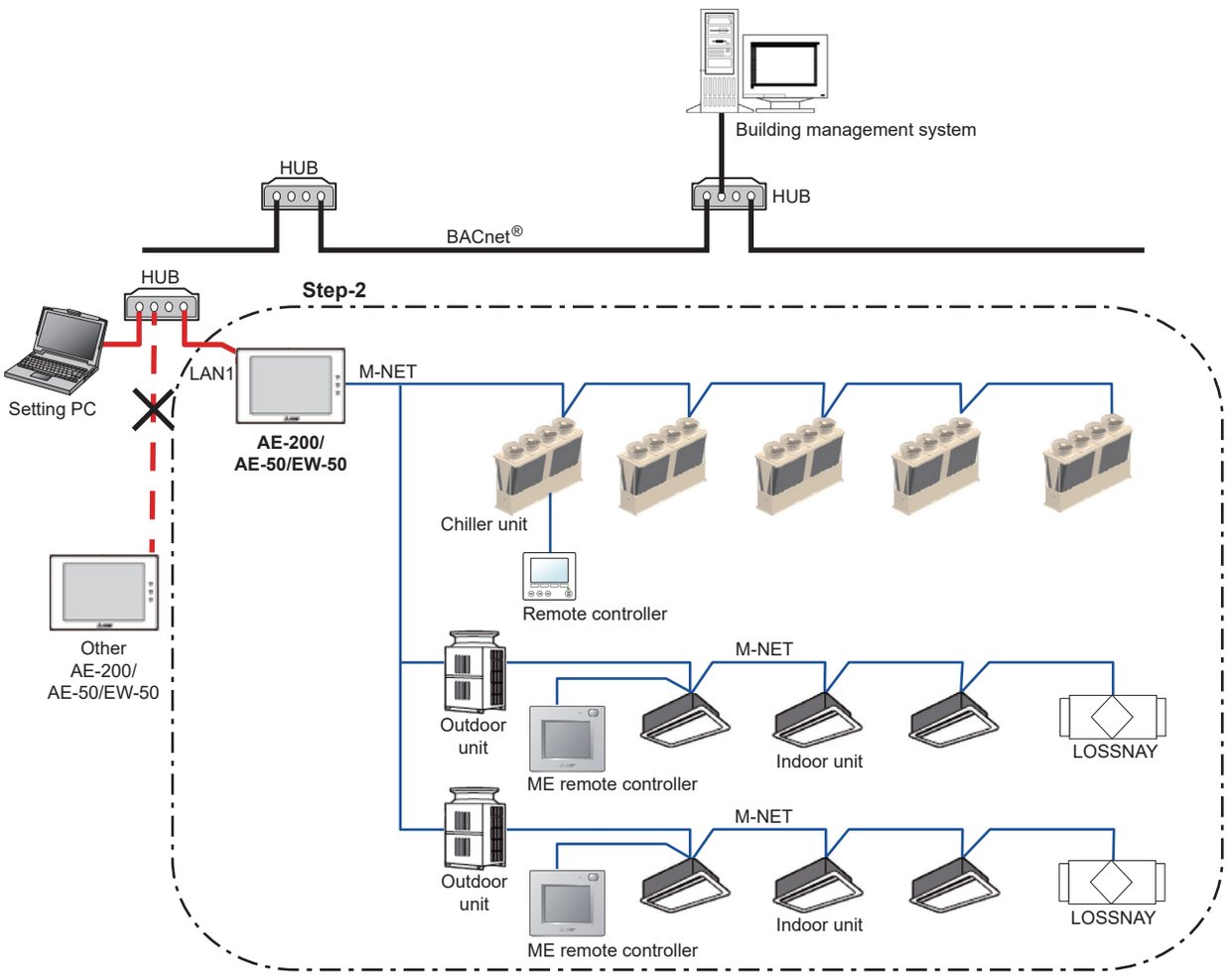
| No. | Main tab | Sub tab |
|---|---|---|
| 1 | Basic Settings | System Configuration |
| 2 | | Basic System |
| 3 | Unit Settings | Groups |
| 4 | | Refrigerant System |
| 5 | | Interlocked LOSSNAY |
| 6 | | Blocks |
| 7 | | Energy Management Block *1 |
| 8 | | PI Controller |
| 9 | | AI Controller |
| 10 | Floor Settings | Floor |
| 11 | | Floor Layout |
| 12 | | Floor for Integrated Centralized Control Web |
| 13 | | Floor Layout for Integrated Centralized Control Web |

*1 The setting is required when an apportioned electricity billing function is used.

# 7-4. Step-2 Trial run of the air conditioning system

Carry out trial run only for the air conditioning system (within the dotted line in the diagram below). For details, refer to the Installation Manual of the AE-200/AE-50/EW-50.

* A trial run of the air conditioning single unit should be completed beforehand and the following should be performed when it is in an operational state.



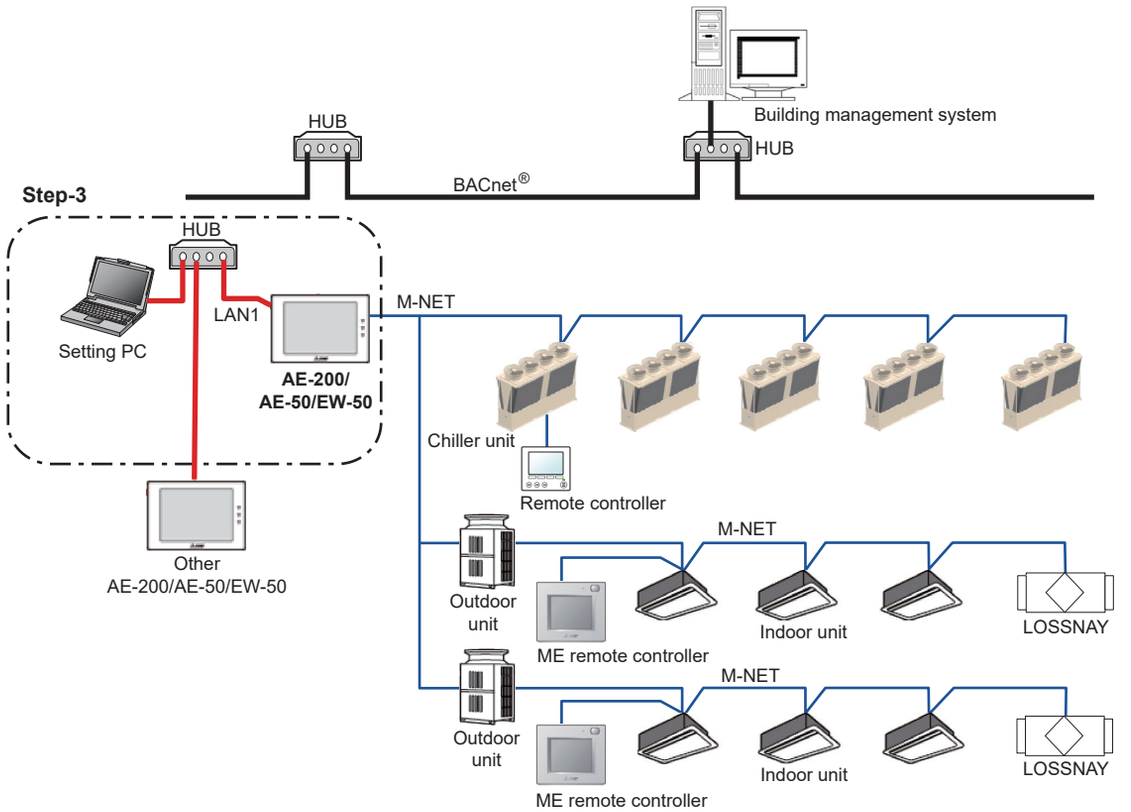

## (1) Trial run of the air conditioning units

Perform trial run operations from the AE-200/AE-50/EW-50 and check the operating state of each unit.

* For the method of carrying out the trial run, refer to the Installation Manual for the air conditioning unit, local remote controller and AE-200/AE-50/EW-50.

# 7-5. Step-3 Initial settings for the BACnet® related items

Make the initial settings related to BACnet® using the BACnet® Setting Tool.




## (1) Data setting

LAN2 (BACnet®) settings and BACnet® related settings are made using the BACnet® Setting Tool which has been installed on the Setting PC. Because the BACnet® Setting Tool can only configure single AE-200/AE-50/EW-50 at one time, even when the system is configured with multiple AE-200/AE-50/EW-50 units, it is necessary to configure each AE-200/AE-50/EW-50 unit.

The setting items are as follows. (Refer to the AE-200/AE-50/EW-50 Instruction Book (BACnet® Setting Tool) for details for each of the items.)

① LAN2 (BACnet®) settings

Settings are made for the IP address, subnet mask, and default gateway of LAN2 (BACnet®) of the AE-200/AE-50/EW-50.

| No. | Main tab | Sub tab |
|---|---|---|
| 1 | System Settings | Basic Settings |

Important

When the IP address of AE-200/AE-50/EW-50 overlaps the IP address of another unit inside the network, not only can AE-200/AE-50/EW-50 not carry out BACnet® communication normally but other devices also cannot carry out BACnet® communication normally. Before connecting AE-200/AE-50/EW-50 to BACnet®, check the IP address used on AE-200/AE-50/EW-50 and make settings.

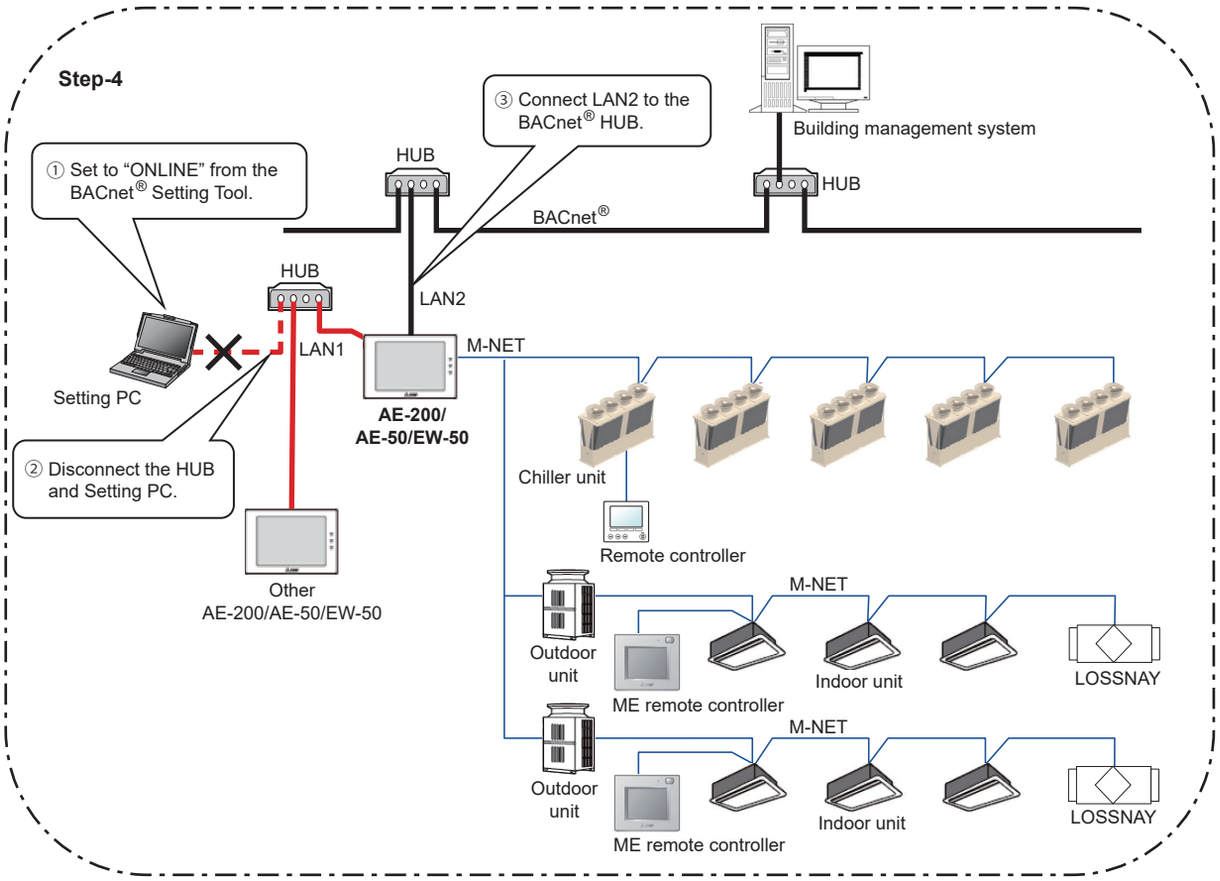
② BACnet® related settings

Settings are made for the device No. of AE-200/AE-50/EW-50, the notification destination and whether or not an object is used.

| No. | Main tab | Sub tab |
|---|---|---|
| 1 | BACnet Settings | BACnet |
| 2 | | Network and Device |
| 3 | | COV Notification |
| 4 | | Event Notification |
| 5 | | Object |
| 6 | | Other |

# 7-6. Step-4 Trial run of BACnet® function

Connect the building management system and carry out a trial run.




### (1) ONLINE setting

A setting is made to “ONLINE” from the BACnet® Setting Tool. AE-200/AE-50/EW-50 restarts automatically. (approximately 10 minutes for maximum time required)
When AE-200/AE-50/EW-50 restarts, a group device with no remote controller may stop.
When a valid “BACnet connection” license is not registered, the setting will not change to “ONLINE”.

### (2) Removal of Setting PC

Remove the LAN cable from the Setting PC.

### (3) BACnet® connection

Connect the LAN2 port of AE-200/AE-50/EW-50 and BACnet® using a LAN cable.

### (4) Trial run item and trial run method

Refer to the following pages for trial run items and trial run methods.
Note that an air conditioning unit and building management system are required for the trial run.

## Method of carrying out trial runs for air conditioning control system (AE-200/AE-50/EW-50) BACnet® function

Check the objects used in the system.
Refer to the table in section 5-2-1 “Instance number for basic functions” as to whether or not objects can be supported by different unit types.

| Object | Object ID | Status | Checking procedures |
|---|---|---|---|
| On Off Setup *1 | BO_01xx01 | INACTIVE(0): OFF<br>ACTIVE(1): ON | (1)From the building management system, operate run/stop for a specific group.<br>(2)Using AE-200/AE-50/EW-50 or the remote controller, check to see that the run/stop state of the relevant group is updated to an operating state. |
| On Off State | BI_01xx02 | INACTIVE(0): OFF<br>ACTIVE(1): ON | (1)Using AE-200/AE-50/EW-50 or the remote controller, operate run/stop of a specific group.<br>(2)In the building management system, check to see that the state of run/stop of the relevant group is updated to the operating state. |
| Alarm Signal | BI_01xx03 | INACTIVE(0): Normal<br>ACTIVE(1): Error | (1)Cause air conditioning unit of a specific group to generate an error.<br>(2)In the building management system, check to see that the alarm signal of the relevant group has been updated to “Error” (ACTIVE).*2<br>(3)Return from an error in an air conditioning unit of a specific group.<br>(4)In the building management system, check to see that the alarm signal of the relevant group has been updated to “Normal” (INACTIVE). |
| Error Code | MI_01xx04 | 01: Normal<br>02: Other errors<br>03: Refrigeration system fault<br>04: Water system error<br>05: Air system error<br>06: Electronic system error<br>07: Sensor fault<br>08: Communication error<br>09: System error | (1)Remove the M-NET transmission line which is connected to the AE-200/AE-50/EW-50. *3<br>(2)In the building management system, check to see that error codes for all groups have been updated to “Communication error” (08).<br>(3)Connect the M-NET transmission line to the AE-200/AE-50/EW-50.<br>(4)In the building management system, check to see that error codes for all groups have been updated to “Normal” (01).<br>(Perform this when no other errors have occurred.<br>In addition, other errors may occur when there is a communication error, however, in this checking step, attention should be focused on error codes). |
| Operational Mode Setup | MO_01xx05 | 01: Cool<br>02: Heat<br>03: Fan<br>04: Auto<br>05: Dry *4<br>06: Setback *5 | (1)From the building management system, change the operational mode for a specific group.<br>(2)Using AE-200/AE-50/EW-50 or the remote controller, check to see that the operational mode for the relevant group is updated to the operating mode. |

| Object | Object ID | Status | Checking procedures |
|---|---|---|---|
| Operational Mode State | MI_01xx06 | 01: Cool<br>02: Heat<br>03: Fan<br>04: Auto<br>05: Dry *4<br>06: Setback *5 | (1)Using AE-200/AE-50/EW-50 or the remote controller, change the operational mode for a specific group.<br>(2)In the building management system, check to see that the operational mode for the relevant group has been updated to the operating mode. |
| Fan Speed Setup | MO_01xx07 | 01: Low<br>02: High<br>03: Mid 2 *6<br>04: Mid 1 *6<br>05: Auto | (1)From the building management system, change the fan speed for a specific group.<br>(2)Using AE-200/AE-50/EW-50 or the remote controller, check to see that the fan speed for the relevant group is updated to the operating fan speed. |
| Fan Speed State | MI_01xx08 | 01: Low<br>02: High<br>03: Mid 2 *6<br>04: Mid 1 *6<br>05: Auto | (1)Using AE-200/AE-50/EW-50 or the remote controller, change the fan speed for a specific group.<br>(2)In the building management system, check to see that the fan speed for the relevant group is updated to the operating fan speed. |
| Room Temp<br>[Water Temp] | AI_01xx09 | ºF/ºC<br>(32ºF–199ºF/0.0ºC–99.0ºC) *7 | (1)Change the intake air temperature for a specific group by cooling or heating.<br>(2)Check to see that the display on the building management system coincides with the display on the AE-200/AE-50/EW-50 or the remote controller. *17 |
| Set Temp<br>[Set Water Temp] *8 | AV_01xx10 | ºF/ºC<br>(32ºF–199ºF/0.0ºC–99.0ºC) *7 | (1)From the building management system, set the set temperature for a specific group.<br>(2)Using AE-200/AE-50/EW-50 or the remote controller, check to see that the set temperature for the relevant group has been updated to an operating value.<br>(3)Using AE-200/AE-50/EW-50 or the remote controller, change the set temperature for a specific group.<br>(4)In the building management system, check to see that the set temperature for the relevant group has been updated to the operating value. |
| Set Temp Cool *8 | AV_01xx24 | ºF/ºC<br>(32ºF–199ºF/0.0ºC–99.0ºC) *7 | (1)From the building management system, set the cooling set temperature for a specific group.<br>(2)Using AE-200/AE-50/EW-50 or the remote controller, check to see that the cooling set temperature for the relevant group has been updated to an operating value.<br>(3)Using AE-200/AE-50/EW-50 or the remote controller, change the cooling set temperature for a specific group.<br>(4)In the building management system, check to see that the cooling set temperature for the relevant group has been updated to the operating value. |

| Object | Object ID | Status | Checking procedures |
|---|---|---|---|
| Set Temp Heat *8 | AV_01xx25 | ºF/ºC (32ºF–199ºF/0.0ºC–99.0ºC) *7 | (1)From the building management system, set the heating set temperature for a specific group.<br>(2)Using AE-200/AE-50/EW-50 or the remote controller, check to see that the heating set temperature for the relevant group has been updated to an operating value.<br>(3)Using AE-200/AE-50/EW-50 or the remote controller, change the heating set temperature for a specific group.<br>(4)In the building management system, check to see that the heating set temperature for the relevant group has been updated to the operating value. |
| Set Temp Auto *8 | AV_01xx26 | ºF/ºC (32ºF–199ºF/0.0ºC–99.0ºC) *7 | (1)From the building management system, set the set temperature (single-set-point in the Auto mode) for a specific group.<br>(2)Using AE-200/AE-50/EW-50 or the remote controller, check to see that the set temperature (single-set-point in the Auto mode) for the relevant group has been updated to an operating value.<br>(3)Using AE-200/AE-50/EW-50 or the remote controller, change the set temperature (single-set-point in the Auto mode) for a specific group.<br>(4)In the building management system, check to see that the set temperature (single-set-point in the Auto mode) for the relevant group has been updated to the operating value. |
| Set High Limit Setback Temp *5 | AV_01xx27 | ºF/ºC (32ºF–199ºF/0.0ºC–99.0ºC) *7 | (1)From the building management system, set the set temperature (upper limit in the Setback mode) for a specific group.<br>(2)Using AE-200/AE-50/EW-50 or the remote controller, check to see that the set temperature (upper limit in the Setback mode) for the relevant group has been updated to an operating value.<br>(3)Using AE-200/AE-50/EW-50 or the remote controller, change the set temperature (upper limit in the Setback mode) for a specific group.<br>(4)In the building management system, check to see that the set temperature (upper limit in the Setback mode) for the relevant group has been updated to the operating value. |
| Set Low Limit Setback Temp *5 | AV_01xx28 | ºF/ºC (32ºF–199ºF/0.0ºC–99.0ºC) *7 | (1)From the building management system, set the set temperature (lower limit in the Setback mode) for a specific group.<br>(2)Using AE-200/AE-50/EW-50 or the remote controller, check to see that the set temperature (lower limit in the Setback mode) for the relevant group has been updated to an operating value.<br>(3)Using AE-200/AE-50/EW-50 or the remote controller, change the set temperature (lower limit in the Setback mode) for a specific group.<br>(4)In the building management system, check to see that the set temperature (lower limit in the Setback mode) for the relevant group has been updated to the operating value. |

| Object | Object ID | Status | Checking procedures |
|---|---|---|---|
| Filter Sign [Circulating Water Exchange Sign] | BI_01xx11 | INACTIVE(0): OFF<br>ACTIVE(1): ON | (1)Issue the filter sign (circulating water exchange sign) for a specific group.<br>(2)In the building management system, check to see that the filter sign (circulating water exchange sign) for the relevant group has been updated to “ON” (ACTIVE). |
| Filter Sign Reset [Circulating Water Exchange Sign Reset] | BV_01xx12 | INACTIVE(0): Reset<br>ACTIVE(1): Void | (1)From the building management system, carry out operations for filter sign reset (circulating water exchange sign reset) for the group which has detected (“ON” (ACTIVE)) filter sign (circulating water exchange sign).<br>(2)In the building management system, check to see that filter sign (circulating water exchange sign) of the relevant group has been updated to “OFF” (INACTIVE). |
| Prohibition On Off *1 | BV_01xx13 | INACTIVE(0): Permit<br>ACTIVE(1): Prohibit | (1)From the building management system, carry out prohibition operation for remote controller operation (run/stop) for a specific group.<br>(2)Check to see that run/stop operations have been prohibited by the remote controller in the relevant group.<br>(3)From the building management system, carry out permission operation for remote controller operation (run/stop) for a specific group.<br>(4)Check to see that run/stop operations have been permitted by the remote controller in the relevant group. |
| Prohibition Mode | BV_01xx14 | INACTIVE(0): Permit<br>ACTIVE(1): Prohibit | • Although the operating target is an operational mode, the checking method is the same as “Prohibition On Off” above. |
| Prohibition Filter Sign Reset [Prohibition Circulating Water Exchange Sign Reset] | BV_01xx15 | INACTIVE(0): Permit<br>ACTIVE(1): Prohibit | • Although the operating target is resetting filter sign (circulating water exchange sign), the checking method is the same as “Prohibition On Off” above. |
| Prohibition Set Temperature | BV_01xx16 | INACTIVE(0): Permit<br>ACTIVE(1): Prohibit | • Although the operating target is a set temperature, the checking method is the same as “Prohibition On Off” above. |
| Prohibition Fan Speed | BV_01xx17 | INACTIVE(0): Permit<br>ACTIVE(1): Prohibit | • Although the operating target is a fan speed, the checking method is the same as “Prohibition On Off” above. |
| M-NET Communication State | BI_01xx20 | INACTIVE(0): Normal<br>ACTIVE(1): Error | (1)Remove the M-NET transmission line which is connected to the AE-200/AE-50/EW-50. *3<br>(2)In the building management system, check to see that the M-NET communication status of all groups has been updated to “Error” (ACTIVE).<br>(3)Connect the M-NET transmission line to the AE-200/AE-50/EW-50.<br>(4)In the building management system, check to see that the M-NET communication state for all groups has been updated to “Normal” (INACTIVE).<br>(Other errors occur when there is a communication error, however, in this checking step, attention should be focused on the M-NET communication state). |

| Object | Object ID | Status | Checking procedures |
|---|---|---|---|
| System Forced Off (individual) | BV_01xx21 | INACTIVE(0): Reset<br>ACTIVE(1): Execute | (1)Set “External Input Setting” of the AE-200/AE-50/EW-50 to “Demand (Level signal)/Not in use” *9 and operate emergency stop for a specific group from the building management system.<br>(2)In the building management system, check to see that the air conditioning units of the relevant group are stopped. Also, check to see that run/stop operations have been prohibited by the remote controller in the relevant group.<br>(3)From the building management system, carry out emergency stop release for a specific group.<br>(4)Check to see that run/stop operations have been permitted by the remote controller in the relevant group. |
| System Forced Off (collective) | BV_019921 | INACTIVE(0): Reset<br>ACTIVE(1): Execute | (1)Set “External Input Setting” of the AE-200/AE-50/EW-50 to “Demand (Level signal)/Not in use” *9 and carry out batch emergency stop from the building management system.<br>(2)In the building management system, check to see that all air conditioning units have been stopped. Also, check to see that run/stop operations have been prohibited by all remote controllers.<br>(3)From the building management system, carry out batch emergency stop release.<br>(4)Check to see that run/stop operations have been permitted by all remote controllers. |
| Air Direction Setup | MO_01xx22 | 01: Horizontal<br>02: Downblow 60%<br>03: Downblow 80%<br>04: Downblow 100%<br>05: Swing | (1)From the building management system, change the air direction for a specific group.<br>(2)Using AE-200/AE-50/EW-50 or the remote controller, check to see that the air direction for the relevant group is updated to the operating air direction. |
| Air Direction State | MI_01xx23 | 01: Horizontal<br>02: Downblow 60%<br>03: Downblow 80%<br>04: Downblow 100%<br>05: Swing | (1)Using AE-200/AE-50/EW-50 or the remote controller, change the air direction for a specific group.<br>(2)In the building management system, check to see that the air direction for the relevant group is updated to the operating air direction. |
| Ventilation Mode Setup | MO_01xx35 | 01: Heat Recovery<br>02: Bypass<br>03: Auto | (1)From the building management system, change the ventilation mode for a specific group.<br>(2)Using AE-200/AE-50/EW-50 or the remote controller, check to see that the ventilation mode for the relevant group is updated to the operating mode. |
| Ventilation Mode State | MI_01xx36 | 01: Heat Recovery<br>02: Bypass<br>03: Auto | (1)Using AE-200/AE-50/EW-50 or the remote controller, change the ventilation mode for a specific group.<br>(2)In the building management system, check to see that the ventilation mode for the relevant group is updated to the operating mode. |
| Air To Water Mode Setup | MO_01xx37 | 01: Heating<br>02: Heating ECO<br>03: Hot Water<br>04: Anti-freeze<br>05: Cooling | (1)From the building management system, change the Air To Water mode for a specific group.<br>(2)Using AE-200/AE-50/EW-50 or the remote controller, check to see that the Air To Water mode for the relevant group is updated to the operating mode. |

| Object | Object ID | Status | Checking procedures |
|---|---|---|---|
| Air To Water Mode State | MI_01xx38 | 01: Heating<br>02: Heating ECO<br>03: Hot Water<br>04: Anti-freeze<br>05: Cooling | (1)Using AE-200/AE-50/EW-50 or the remote controller, change the Air To Water mode for a specific group.<br>(2)In the building management system, check to see that the Air To Water mode for the relevant group is updated to the operating mode. |
| System Alarm Signal | BI_010048 | INACTIVE(0): Normal<br>ACTIVE(1): Error | (1)Shut off the power to the AE-200/AE-50/EW-50, remove the M-NET power jumper (CN21), and turn the power back on.<br>(2)In the building management system, check to see that system alarm signal has been updated to “Error” (ACTIVE). *10<br>(3)Shut off the power to the AE-200/AE-50/EW-50, attach the M-NET power jumper (CN21), and turn the power back on.<br>(4)In the building management system, check to see that the system alarm signal has been updated to “Normal” (INACTIVE). (Other errors occur when there is a communication error, however, in this checking step, attention should be focused on the system alarm signal). |
| Error Code Detail | AI_01xx49 | Normal: 8000<br>Error: Error code (4 digits) | (1)Remove the M-NET transmission line which is connected to the AE-200/AE-50/EW-50. *3<br>(2)In the building management system, check to see that Error Code Detail for all groups have been updated to “M-NET communication error” (660*).<br>(3)Connect the M-NET transmission line to the AE-200/AE-50/EW-50.<br>(4)In the building management system, check to see that Error Code Detail for all groups have been updated to “Normal” (8000). (Perform this when no other errors have occurred.<br>In addition, other errors may occur when there is a communication error, however, in this checking step, attention should be focused on Error Code Detail). |
| PIcontroller Alarm Signal | BI_41mm03 | INACTIVE(0): Normal<br>ACTIVE(1): Error | (1)Remove the M-NET transmission line which is connected to a specific PI controller.<br>(2)In the building management system, check to see that PI controller alarm signal for the relevant PI controller has been updated to “Error” (ACTIVE). *11<br>(3)Connect the M-NET transmission line to a specific PI controller.<br>(4)In the building management system, check to see that PI controller alarm signal for the relevant PI controller has been updated to “Normal” (INACTIVE). |

| Object | Object ID | Status | Checking procedures |
|---|---|---|---|
| Group Apportioned Electric Energy *12 *13 *14 | AC_01xx39 | 0–999,999,999 [0.1 kWh] | (1)From the building management system, set the current values for electric energy (indoor unit + outdoor unit) for each group in a specific group in the “Value_Set” property. Alternatively, in the building management system, record the current values for electric energy (indoor unit + outdoor unit) for each specific group.<br>(2)Operate the air conditioning units in the relevant group continuously for at least two hours.<br>(3)In the building management system, obtain electric energy (indoor unit + outdoor unit) for each group in the relevant group, total the difference with the value set in the “Value_Set” property (or the electric energy recorded in (1)) for each energy management block, and check (using a CSV file) to see that this coincides with the energy management block apportioned electric energy. |
| Interlocked Units Apportioned Electric Energy *12 *13 *14 | AC_61aa39 | 0–999,999,999 [0.1 kWh] | (1)From the building management system, without registering this in a group, set the current values for electric energy (indoor unit + outdoor unit) for specific OA Processing Unit which has been set as an interlocked unit in the “Value_Set” property. Alternatively, in the building management system, without registering this in a group, record the current values for electric energy (indoor unit + outdoor unit) for specific OA Processing Unit which has been set as an interlocked unit.<br>(2)Operate the relevant interlocked units continuously for at least two hours.<br>(3)In the building management system, obtain electric energy (indoor unit + outdoor unit) for the relevant interlocked unit, total the difference with the value set in the “Value_Set” property (or the electric energy recorded in (1)) for each energy management block, and check (using a CSV file) to see that this coincides with the energy management block apportioned electric energy. |
| PIcontroller Electric Energy 1–4 *12 *13 *14 | AC_41mm40–43 | 0–999,999,999 [0.1 kWh] | (1)From the building management system, set the current value for electric energy for the electricity meter (1 to 4) connected to the PI controller pulse input in the “Value_Set” property. Alternatively, in the building management system, record the current value for electric energy for the electricity meter (1 to 4) connected to the PI controller pulse input.<br>(2)Operate devices connected to the electricity meter (1 to 4) connected to pulse input of the PI controller continuously for at least two hours.<br>(3)In the building management system, check (using a CSV file) to see that the electric energy (or difference between the current electric energy and that recorded in (1)) coincides with the reading of the metering device of AE-200/AE-50/EW-50. |

| Object | Object ID | Status | Checking procedures |
|---|---|---|---|
| Pulse Input Electric Energy 1–4 *12 *13 *14 | AC_410040–43 | 0–999,999,999 [0.1 kWh] | (1)From the building management system, set the current value for electric energy for the electricity meter (1 to 4) connected to the AE-50/EW-50 built-in Pulse Input (PI) in the “Value_Set” property. Alternatively, in the building management system, record the current value for electric energy for the electricity meter (1 to 4) connected to the AE-50/EW-50 built-in Pulse Input (PI).<br>(2)Operate devices connected to the electricity meter (1 to 4) connected to the built-in pulse input (PI) of the AE-50/EW-50 continuously for at least two hours.<br>(3)In the building management system, check (using a CSV file) to see that the electric energy (or difference between the current electric energy and that recorded in (1)) coincides with the reading of the metering device of AE-200/AE-50/EW-50. |
| Group Apportionment Parameter *12 *13 *15 | AC_01xx44 | 0–999,999,999 [0.1 (No Units)] | (1)From the building management system, set the current values for apportionment parameter (outdoor unit) for each group in a specific group in the “Value_Set” property. Alternatively, in the building management system, record the current values for apportionment parameter (outdoor unit) for each specific group.<br>(2)Operate the air conditioning units in the relevant group for at least two hours continuously.<br>(3)In the building management system, obtain apportionment parameter (outdoor unit) for each group in the relevant group, total the difference with the value set in the “Value_Set” property (or the electric energy recorded in (1)) for each energy management block, and check (using a CSV file) to see that this coincides with the outdoor unit apportionment parameter of the energy management block. |
| Interlocked Units Apportionment Parameter *12 *13 *15 | AC_61aa44 | 0–999,999,999 [0.1 (No Units)] | (1)From the building management system, without registering this in a group, set the current values for apportionment parameter (outdoor unit) for specific OA Processing Unit which has been set as an interlocked unit in the “Value_Set” property. Alternatively, in the building management system, without registering this in a group, record the current values for apportionment parameter (outdoor unit) for the specific OA Processing Unit which has been set as an interlocked unit.<br>(2)Operate the relevant interlocked units continuously for at least two hours.<br>(3)In the building management system, obtain apportionment parameter (outdoor unit) for the relevant interlocked unit, total the difference with the value set in the “Value_Set” property (or the apportionment parameter recorded in (1)) for each energy management block, and check (using a CSV file) to see that this coincides with the outdoor unit apportionment parameter of the energy management block. |

| Object | Object ID | Status | Checking procedures |
|---|---|---|---|
| Night Purge State | BI_01xx46 | INACTIVE(0): OFF<br>ACTIVE(1): ON | (1)Using AE-200/AE-50/EW-50 or the remote controller, run Night Purge for LOSSNAY of a specific group.<br>(2)In the building management system, check to see that the status of Night Purge of the relevant group has been updated to “ON”.<br>(3)Using AE-200/AE-50/EW-50 or the remote controller, stop Night Purge for LOSSNAY of a specific group.<br>(4)In the building management system, check to see that the status of Night Purge of the relevant group has been updated to “OFF”. |
| Thermo On Off State | BI_01xx47 | INACTIVE(0): Thermo OFF<br>ACTIVE(1): Thermo ON | (1)Using AE-200/AE-50/EW-50 or the remote controller, have a specific group perform fan operation.<br>(2)In the building management system, check to see that the thermo ON/OFF status of the relevant group has been updated to “Thermo OFF”.<br>(3)Using AE-200/AE-50/EW-50 or the remote controller, cool a specific group using a low temperature setting of at least 2°C lower than the room temperature or heat at a high temperature setting of at least 2°C higher than the room temperature.<br>(4)In the building management system, check to see that the thermo ON/OFF status of the relevant group has been updated to “Thermo ON”. |
| External Heat Source State | BI_01xx50 | INACTIVE(0): OFF<br>ACTIVE(1): ON | (1)Change the ON/OFF conditions of the external heat source that is connected to the indoor unit CN24 of the specific group.<br>(2)In the building management system, check to see that the state of External heat source for the relevant group is updated to the changed value. |
| Trend Log Room Temp *16 | LOG_01xx80 | | (1)Record the “Room Temp” value and check the log record of the “LogBuffer” property and check that the “Room Temp” data has been logged in after the time longer than collection cycle that is set from the building management system has been elapsed. |
| Trend Log Group Apportioned Electric Energy *12 *14 *16 | LOG_01xx83 | | (1)Record the “Group Apportioned Electric Energy” value and check the log record of the “LogBuffer” property and check that the “Group Apportioned Electric Energy” data has been logged in after the time longer than collection cycle that is set from the building management system has been elapsed. |
| Trend Log Interlocked Units Apportioned Electric Energy *12 *14 *16 | LOG_61aa83 | | (1)Record the “Interlocked Units Apportioned Electric Energy” value and check the log record of the “LogBuffer” property and check that the “Interlocked Units Apportioned Electric Energy” data has been logged in after the time longer than collection cycle that is set from the building management system has been elapsed. |
| Trend Log PIcontroller Electric Energy 1–4 *12 *14 *16 | LOG_41mm84~87 | | (1)Record the “PIcontroller Electric Energy 1–4” value and check the log record of the “LogBuffer” property and check that the “PIcontroller Electric Energy 1–4” data has been logged in after the time longer than collection cycle that is set from the building management system has been elapsed. |

| Object | Object ID | Status | Checking procedures |
|---|---|---|---|
| Trend Log Pulse Input Electric Energy 1–4 *12 *14 *16 | LOG_410084~87 | | (1)Record the “Pulse Input Electric Energy 1–4” value and check the log record of the “LogBuffer” property and check that the “Pulse Input Electric Energy 1–4” data has been logged in after the time longer than collection cycle that is set from the building management system has been elapsed. |
| Trend Log Group Apportionment Parameter *12 *15 *16 | LOG_01xx88 | | (1)Record the “Group Apportionment parameter” value and check the log record of the “LogBuffer” property and check that the “Group Apportionment parameter” data has been logged in after the time longer than collection cycle that is set from the building management system has been elapsed. |
| Trend Log Interlocked Units Apportionment Parameter *12 *15 *16 | LOG_61aa88 | | (1)Record the “Interlocked Units Apportionment Parameter” value and check the log record of the “LogBuffer” property and check that the “Interlocked Units Apportionment Parameter” data has been logged in after the time longer than collection cycle that is set from the building management system has been elapsed. |

* xx: Group number (01–50)

* mm: PI controller address (01–50)

* aa: Interlocked unit address (01–50)

*1 Do not use this when “External Input Setting” for AE-200/AE-50/EW-50 is set to “ON/OFF (Level signal)”. “External Input Setting” can be configured on the Initial Setting Tool, Web Browser for Initial Settings, or AE-200/AE-50’s LCD. (Refer to the AE-200/AE-50/EW-50 Instruction Book (Initial Settings) for settings methods.)

*2 The air conditioning unit error code (4 digits) is output to the Description and the Message Text of event notification. When an error occurs, check to see that it coincides with the error code (4 digits) detected by AE-200/AE-50/EW-50 or the remote controller.

*3 When the M-NET transmission line has been removed, units in a group with no remote controller stop.

*4 “Dry” can be used only when the “Use Dry Mode” setting is enabled (checked) on the BACnet® Setting Tool. (The default setting is disabled (unchecked).)

*5 It can only be used if the system controller is AE-200A/AE-50A/EW-50A and the indoor unit is a Setback mode supported model.

*6 “Mid 1” and “Mid 2” can be used only when the “Use Fan Speed Mid1/Mid2” setting is enabled (checked) on the BACnet® Setting Tool. (The default setting is disabled (unchecked).)

*7 Accuracy and value ranges in BACnet®. Accuracy and value ranges that can be actually set or measured will differ depending on the model of the connected air conditioning units and remote controllers.

*8 The objects that can be used for the temperature setting differ depending on the model and the setting. Refer to section 5-3 “Set temperature objects” for details.

*9 For details of the setting method, refer to the item in “External Input Setting” in the AE-200/AE-50/EW-50 Instruction Book (Initial Settings).

*10 The error code (4 digits) is output to the Description and the Message Text of event notification. When an error occurs, check to see that it coincides with the error code (4 digits) detected by AE-200/AE-50/EW-50.

*11 Outputs the PI controller error code (4 digits) to the Description and EVENT Notification Message Text. Check that when an error occurs, this matches the error code (4 digits) detected with the AE-200/AE-50/EW-50.

*12 When “Charge” license is not registered, the correct value is not stored.

*13 Results until XX:00 and XX:30 minutes every hour are reflected at XX:15 and XX:45 respectively.

*14 Can be used only if there is a metering device.

*15 Can be used only when there is no metering device.

*16 The initial value of the log interval of the trend log is 1 minute (Room Temp) or 30 minutes (other than Room Temp). To change the log interval, it is necessary to write (WriteProperty) in the “Log_Interval” property from BACnet® Trial Run Tool before trial run.

*17 When the display temperature of the building management system is updated by COV notification, the difference of a maximum of [COV_Increment setting value + 0.1]ºC can be generated between the temperatures displayed on the building management system and on the AE-200/AE-50/EW-50. If the difference of the display temperature is within this value, assume that there is no difference.

Objects for chillers

| Object | Object ID | Status | Checking procedures |
|---|---|---|---|
| Chiller On Off Setup *1 | BO_71tt01 | INACTIVE(0): OFF<br>ACTIVE(1): ON | (1)Turn on or off a specific system from the building management system.<br>(2)From AE-200/AE-50/EW-50 or the remote controller, check that the ON/OFF state of the system changes accordingly. |
| Chiller On Off State | BI_71tt02 | INACTIVE(0): OFF<br>ACTIVE(1): ON | (1)Turn on or off a specific system from AE-200/AE-50/EW-50 or the remote controller.<br>(2)From the building management system, check that the ON/OFF state of the system changes accordingly. |
| Chiller Operational Mode Setup *1 *4 | MO_71tt03 | 01: Heating<br>02: Cooling<br>03: Anti-freeze<br>04: Heating ECO | (1)Turn off a specific system from the building management system.<br>(2)Change the operational mode of the system from the building management system.<br>(3)After one or more minutes have elapsed, check that the operational mode has been changed from the building management system, and then operate the system.<br>(4)From AE-200/AE-50/EW-50 or the remote controller, check that the operational mode of the system has been changed to the specified mode. |
| Chiller Operational Mode State | MI_71tt04 | 01: Heating<br>02: Cooling<br>03: Anti-freeze<br>04: Heating ECO | (1)Turn off a specific system from AE-200/AE-50/EW-50 or the remote controller.<br>(2)Change the operational mode of the system from AE-200/AE-50/EW-50 or the remote controller.<br>(3)After one or more minutes have elapsed, check that the operational mode has been changed, and then operate the system from AE-200/AE-50/EW-50 or the remote controller.<br>(4)From the building management system, check that the operational mode of the system has been changed to the specified mode. |
| Chiller Fan Mode Setup *1 | MO_71tt05 | 01: Normal<br>02: Snow | (1)Turn off a specific system from the building management system.<br>(2)Operate the ventilation mode of the system from the building management system.<br>(3)Operate the system from the building management system.<br>(4)From AE-200/AE-50/EW-50 or the remote controller, check that the ventilation mode of the system has been changed to the specified mode. |
| Chiller Fan Mode State | MI_71tt06 | 01: Normal<br>02: Snow | (1)Turn off a specific system from AE-200/AE-50/EW-50 or the remote controller.<br>(2)Operate the ventilation mode of the specific system from AE-200/AE-50/EW-50 or the remote controller.<br>(3)Operate the specific system from AE-200/AE-50/EW-50 or the remote controller.<br>(4)From the building management system, check that the ventilation mode of the system has been changed to the specified mode. |

| Object | Object ID | Status | Checking procedures |
|---|---|---|---|
| Chiller Set Temp Cool *1 | AV_71tt07 | °C<br>(-99.0°C–99.0°C)<br>*2 | (1)Set the Set Temp Cool for a specific system from the building management system.<br>(2)From AE-200/AE-50/EW-50 or the remote controller, check that the Set Temp Cool for the system has been changed.<br>(3)Set the Set Temp Cool for the specific system from AE-200/AE-50/EW-50 or the remote controller.<br>(4)From the building management system, check that the Set Temp Cool for the system has been changed. |
| Chiller Set Temp Heat *1 | AV_71tt08 | °C<br>(-99.0°C–99.0°C)<br>*2 | (1)Set the Set Temp Heat for a specific system from the building management system.<br>(2)From AE-200/AE-50/EW-50 or the remote controller, check that the Set Temp Heat for the system has been changed.<br>(3)Set the Set Temp Heat for the specific system from AE-200/AE-50/EW-50 or the remote controller.<br>(4)From the building management system, check that the Set Temp Heat for the system has been changed. |
| Chiller Representative Inlet Water Temp | AI_71tt09 | °C<br>(-99.0°C–99.0°C)<br>*2 | (1)Change the Inlet Water Temp of a specific system.<br>(2)Check that the indication on the building management system matches the indication on AE-200/AE-50/EW-50 or the remote controller. |
| Chiller Representative Outlet Water Temp | AI_71tt10 | °C<br>(-99.0°C–99.0°C)<br>*2 | (1)Change the Outlet Water Temp of a specific system.<br>(2)Check that the indication on the building management system matches the indication on AE-200/AE-50/EW-50 or the remote controller. |
| Chiller Representative Alarm Signal | BI_71tt11 | INACTIVE(0): Normal<br>ACTIVE(1): Error | (1)Produce an error in a specific system of chiller unit.<br>(2)From the building management system, check that the alarm signal for the system has been changed to Error (ACTIVE). *3<br>(3)Reset the error in the system.<br>(4)From the building management system, check that the alarm signal for the system has been changed to Normal (INACTIVE). |
| Chiller Communication State | BI_71tt12 | INACTIVE(0): Normal<br>ACTIVE(1): Error | (1)Remove the M-NET transmission line of the chiller unit from AE-200/AE-50/EW-50.<br>(2)From the building management system, check that the communication state for the system of the chiller unit has been changed to Error (ACTIVE).<br>(3)Connect the M-NET transmission line of the chiller unit to AE-200/AE-50/EW-50.<br>(4)From the building management system, check that the communication state for the system of the chiller unit has been changed to Normal (INACTIVE).<br>(Other errors may occur due to a communication error, but focus on the communication status.) |

| Object | Object ID | Status | Checking procedures |
|---|---|---|---|
| Chiller Prohibition On Off *1 | BV_71tt15 | INACTIVE(0): Permit<br>ACTIVE(1): Prohibit | (1)From the building management system, prohibit the remote control operation (on/off) of a specific system.<br>(2)Using the specific remote controller, check to see that the on/off operation from the remote controller is prohibited.<br>(3)From the building management system, permit the operation (on/off) of a specific remote controller.<br>(4)Using the specific remote controller, check to see that the on/off operation from the remote controller is permitted. |
| Chiller Prohibition Mode | BV_71tt16 | INACTIVE(0): Permit<br>ACTIVE(1): Prohibit | Although the operating and checking target is the Chiller Prohibition Mode, the operating and checking method is the same as “Chiller Prohibition On Off” above. |
| Chiller Prohibition Set Temperature | BV_71tt17 | INACTIVE(0): Permit<br>ACTIVE(1): Prohibit | Although the operating and checking target is the Chiller Prohibition Set Temperature, the operating and checking method is the same as “Chiller Prohibition On Off” above. |
| Chiller Unit Alarm Signal | BI_91uu11 | INACTIVE(0): Normal<br>ACTIVE(1): Error | (1)Produce an error in a specific chiller unit.<br>(2)From the building management system, check that the alarm signal for the unit has been changed to Error (ACTIVE). *3<br>(3)Reset the error in the unit.<br>(4)From the building management system, check that the alarm signal for the unit has been changed to Normal (INACTIVE). |

* tt: Group number of simultaneously operated units including a system representative unit (01–50)

* xx: Simultaneously operated group number (01–50)

* uu: Unit address (01–50)

*1 Chiller units can be operated from the LCD or the building management system only when the command input source of the chiller unit is set to the system controller. In such a case, the chiller unit cannot be operated from the remote controller.

*2 Indicates the accuracy or the value range in BACnet®. The accuracy or the value range that can be actually set or measured varies depending on the model of the chiller unit or the remote controller to be connected.

*3 Alarm signals for chiller objects do not support output of the error code (four digit) for Message Text of Description and EVENT notification.

*4 The Chiller Operational Mode can be changed when the Chiller On Off is set to Off.
Before changing the Chiller Operational Mode Setup, set the Chiller On Off Setup to Off.
Wait at least for one minute, check that the Chiller Operational Mode State has been changed as intended, and re-start the operation using the Chiller On Off Setup.

## Air conditioning control system (AE-200/AE-50/EW-50) BACnet® function trial run check list example

| Object | Object ID | Results |
|---|---|---|
| On Off Setup | BO_01xx01 | |
| On Off State | BI_01xx02 | |
| Alarm Signal (4-digit error code) | BI_01xx03 | |
| Error Code | MI_01xx04 | |
| Operational Mode Setup | MO_01xx05 | |
| Operational Mode State | MI_01xx06 | |
| Fan Speed Setup | MO_01xx07 | |
| Fan Speed State | MI_01xx08 | |
| Room Temp [Water Temp] | AI_01xx09 | |
| Set Temp [Set Water Temp] | AV_01xx10 | |
| Set Temp Cool | AV_01xx24 | |
| Set Temp Heat | AV_01xx25 | |
| Set Temp Auto | AV_01xx26 | |
| Filter Sign [Circulating Water Exchange Sign] | BI_01xx11 | |
| Filter Sign Reset [Circulating Water Exchange Sign Reset] | BV_01xx12 | |
| Prohibition On Off | BV_01xx13 | |
| Prohibition Mode | BV_01xx14 | |
| Prohibition Filter Sign Reset [Prohibition Circulating Water Exchange Sign Reset] | BV_01xx15 | |
| Prohibition Set Temperature | BV_01xx16 | |
| Prohibition Fan Speed | BV_01xx17 | |
| M-NET Communication State | BI_01xx20 | |
| System Forced Off (individual) | BV_01xx21 | |
| System Forced Off (collective) | BV_019921 | |
| Air Direction Setup | MO_01xx22 | |
| Air Direction State | MI_01xx23 | |
| Set High Limit Setback Temp | AV_01xx27 | |
| Set Low Limit Setback Temp | AV_01xx28 | |
| Ventilation Mode Setup | MO_01xx35 | |
| Ventilation Mode State | MI_01xx36 | |
| Air To Water Mode Setup | MO_01xx37 | |
| Air To Water Mode State | MI_01xx38 | |
| System Alarm Signal (4-digit error code) | BI_010048 | |
| Error Code Detail | AI_01xx49 | |
| PIcontroller Alarm Signal (4-digit error code) | BI_41mm03 | |
| Group Apportioned Electric Energy | AC_01xx39 | |
| Interlocked Units Apportioned Electric Energy | AC_61aa39 | |
| PIcontroller Electric Energy 1–4 | AC_41mm40–43 | |
| Pulse Input Electric Energy 1–4 | AC_410040–43 | |
| Group Apportionment Parameter | AC_01xx44 | |
| Interlocked Units Apportionment Parameter | AC_61aa44 | |
| Night Purge State | BI_01xx46 | |
| Thermo On Off State | BI_01xx47 | |
| External Heat Source State | BI_01xx50 | |
| Trend Log Room Temp | LOG_01xx80 | |
| Trend Log Group Apportioned Electric Energy | LOG_01xx83 | |
| Trend Log Interlocked Units Apportioned Electric Energy | LOG_61aa83 | |
| Trend Log PIcontroller Electric Energy 1–4 | LOG_41mm84–87 | |
| Trend Log Pulse Input Electric Energy 1–4 | LOG_410084–87 | |

| Object | Object ID | Results |
|---|---|---|
| Trend Log Group Apportionment Parameter | LOG_01xx88 | |
| Trend Log Interlocked Units Apportionment Parameter | LOG_61aa88 | |
| Chiller On Off Setup | BO_71tt01 | |
| Chiller On Off State | BI_71tt02 | |
| Chiller Operational Mode Setup | MO_71tt03 | |
| Chiller Operational Mode State | MI_71tt04 | |
| Chiller Fan Mode Setup | MO_71tt05 | |
| Chiller Fan Mode State | MI_71tt06 | |
| Chiller Set Temp Cool | AV_71tt07 | |
| Chiller Set Temp Heat | AV_71tt08 | |
| Chiller Representative Inlet Water Temp | AI_71tt09 | |
| Chiller Representative Outlet Water Temp | AI_71tt10 | |
| Chiller Representative Alarm Signal | BI_71tt11 | |
| Chiller Communication State | BI_71tt12 | |
| Chiller Prohibition On Off | BV_71tt15 | |
| Chiller Prohibition Mode | BV_71tt16 | |
| Chiller Prohibition Set Temperature | BV_71tt17 | |
| Chiller Unit Alarm Signal | BI_91uu11 | |

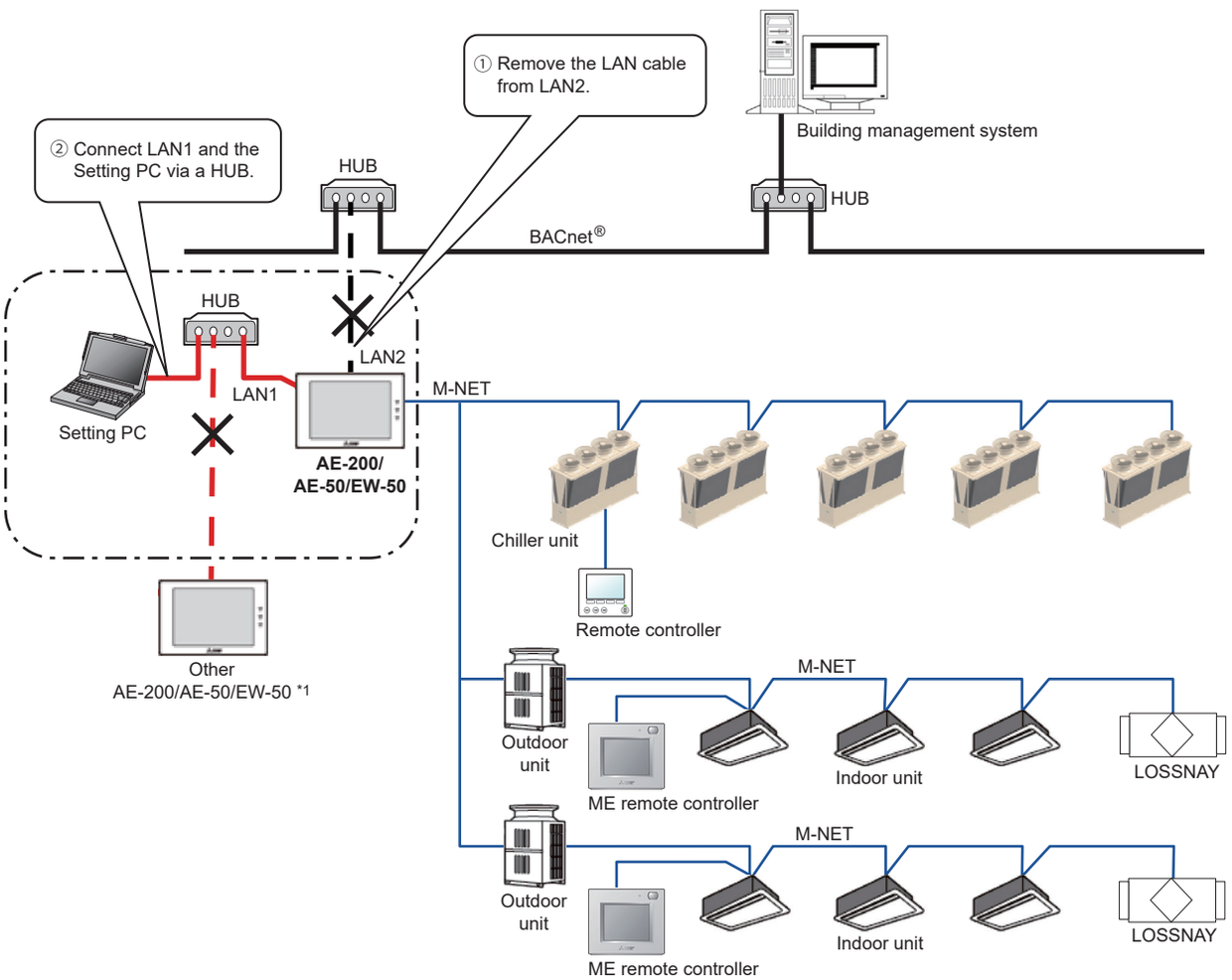
* xx: Group number (01–50), mm: PI controller address (01–50), aa: Interlocked unit address (01–50)
* tt: Group number of simultaneously operated units including a system representative unit (01–50)
* uu: Unit address (01–50)

# 7-7. When changing settings or reconfiguring AE-200/AE-50/EW-50

The procedures for changing settings or reconfiguring AE-200/AE-50/EW-50 using stored settings data are as follows.

Important

When AE-200/AE-50/EW-50 is reconfigured, communication with the building management system is temporarily cut off and the building management system may detect a communication error. Carry out operations after receiving approval from the building manager beforehand.




*1 If the LAN1 connection between AE-200/AE-50/EW-50 is disconnected, then a communication error (6920) may be detected. In this process, ignore the communication error (6920).

## (1) Connecting Setting PC

Before the Setting PC is connected to AE-200/AE-50/EW-50, remove the LAN cable of LAN2 of AE-200/AE-50/EW-50 connected to BACnet®.
Connect the LAN 1 of AE-200/AE-50/EW-50 and the Setting PC using a LAN cable via a HUB.

## (2) Data setting

Setting changes are made on the Setting PC or the setting data stored is read to reconfigure AE-200/AE-50/EW-50.
Settings are performed for initial settings in the air conditioning system, the apportioned electricity billing function settings (only when used) and the BACnet® related settings, in that order.
(For details on setting items and settings in each procedure, refer to section 7-3 “Step-1 Initial settings for the air conditioning system”, AE-200/AE-50/EW-50 Instruction Book (Apportioned Electricity Billing Function), section 7-5 “Step-3 Initial settings for the BACnet® related items”, and AE-200/AE-50/EW-50 Instruction Book (BACnet® Setting Tool).)
Before configuring the BACnet® related items, it is required to set the BACnet® connection mode to “OFFLINE” from the BACnet® Setting Tool.

### (3) Air-conditioning system and apportioned electricity billing function trial run

Carry out a trial run for the air conditioning system and a trial run for the apportioned electricity billing function. Refer to the respective unit Installation Manual for the method of carrying out a trial run of the air conditioning system and the AE-200/AE-50/EW-50 Instruction Book (Apportioned Electricity Billing Function) for the method of carrying out a trial run of the apportioned electricity billing function.

### (4) ONLINE setting

A setting is made to “ONLINE” from the BACnet® Setting Tool. AE-200/AE-50/EW-50 restarts automatically. (approximately 10 minutes for maximum time required)
When AE-200/AE-50/EW-50 restarts, a group device with no remote controller may stop.

### (5) Removing Setting PC

Remove the Setting PC from LAN1 of AE-200/AE-50/EW-50.

### (6) Connecting BACnet®

Connect LAN2 of AE-200/AE-50/EW-50 and BACnet®.

### (7) BACnet® trial run

By performing a trial run of the BACnet® function, check the operation. Refer to section 7-6 “Step-4 Trial run of BACnet® function” for the trial run method.

### (8) Checking ONLINE/OFFLINE setting

Check that all AE-200/AE-50/EW-50 controllers are ONLINE, using the BACnet® ONLINEOFFLINE Confirmation Tool.

# Appendix: Added functions

The added functions are as follows.

| Version | Added item | Description | Reference |
|---|---|---|---|
| Ver. 7.30 | BACnet® function | The air conditioning units can be monitored and operated from the building management system using the BACnet® communication protocol. | All items other than the items below |
| Ver. 7.45 | Specification change of the apportioned electricity billing function | The trend log collection cycle is changed to 30 minutes. | Section 5-5-1 “Apportioned electricity billing function specifications” |
| Ver. 7.50 | Objects added | The following three objects were added.<br>• Prohibition Fan Speed<br>• Error Code Detail<br>• External Heat Source State | Section 4-3 “Objects”<br>Section 5-1 “Controller functions and BACnet® functions”<br>Section 5-2-1 “Instance number for basic functions”<br>Section 5-6 “Alarm Signal”<br>Section 5-7-1 “Event service of objects”<br>Section 5-8 “BACnet® information and storage timing/cycle in nonvolatile memory within the AE-200/AE-50/EW-50”<br>Section 7-6 “Step-4 Trial run of BACnet® function” |
| Ver. 7.71 | Object_Name of Device Object | Device Name character string can be set | Section 5-8 “BACnet® information and storage timing/cycle in nonvolatile memory within the AE-200/AE-50/EW-50” |
| Ver. 7.90 | BACnet® function of the chiller unit | Chiller units can be managed using BACnet®. | Section 3-3 “Chiller unit systems and group configuration”<br>Section 4-3 “Objects”<br>Section 5-1 “Controller functions and BACnet® functions”<br>Section 5-2-1 “Instance number for basic functions”<br>Section 5-6-2 “Alarm signal for chiller object”<br>Section 5-7-1 “Event service of objects”<br>Section 5-8 “BACnet® information and storage timing/cycle in nonvolatile memory within the AE-200/AE-50/EW-50”<br>Section 7-6 “Step-4 Trial run of BACnet® function” |

This product is designed and intended for use in the residential, commercial and light-industrial environment.

The product at hand is based on the following EU regulations:

- Low Voltage Directive 2014/35/EU
- Electromagnetic Compatibility Directive 2014/30/EU

Please be sure to put the contact address/telephone number on this manual before handing it to the customer.

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